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THE
M. H. DE YOUNG
MEMORIAL MUSEUM

GOLDEN GATE PARK
SAN FRANCISCO, CALIFORNIA

"THE POOL OF ENCHANTMENT"

Creation of M. Earl Cummings, noted California sculptor. The figures in the pool are of bronze. Situated in front of main entrance to the Museum.

Story of its foundation and the objects of its founder.

Description of its various galleries.

Brief sketches of the most notable exhibits with accounts of their origin.

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Story of its foundation and the objects of its founder.

Description of its various galleries.

Brief sketches of the most notable exhibits, with accounts of their origin and of the periods of history and industries represented by them.

PUBLISHED UNDER THE AUSPICES OF THE PARK COMMISSION

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PARK COMMISSIONERS FORMALLY ACCEPT MEMORIAL MUSEUM GIFT

Pledging themselves to carry out the wishes of M. H. de Young in regard to conducting the Memorial Museum in Golden Gate Park as a public museum, with free admission and its doors never closed, the Park Commissioners yesterday afternoon completed the formal acceptance of the gift, at the same time extending to Mr. de Young their official thanks for the generous donaton.

The Commissioners accord to the museum the title of "M. H. de Young Memorial Museum," under which name it is recorded in the official documents of the board.

The resolution formally accepting the gift follows:

"Whereas, M. H. de Young has erected in Golden Gate Park in the city and county of San Francisco a museum building known as the M. H. DE YOUNG MEMORIAL MUSEUM, and has installed therein numerous works of art, as well as many useful and important educational exhibits; and

"Whereas, Being desirous of securing for all time to the people of the city and county of San Francisco the free and continuous use and enjoyment of this building and of the exhibits installed therein as a permanent museum, Mr. de Young has offered to the Park Commissioners of the city and county of San Francisco a deed whereby he undertakes to transfer all his interest in and to these valuable properties to the Commissioners, to be administered by them as a public museum under and pursuant to the powers and duties prescribed for their official conduct in Article XIV of the charter of the city and county of San Francisco; now, therefore, be it

"Resolved, That the Park Commissioners of the city and county of San Francisco accept the said deed and the said property, and undertake on behalf of themselves and their successors in office to administer the same as a public museum under and pursuant to the powers and duties prescribed by law for their official conduct as aforesaid; and be it further

"Resolved, That the Park Commissioners of the city and county of San Francisco hereby express to Mr. de Young on behalf of themselves and on behalf of the people of the city and county of San Francisco their appreciation of his spirit of active and unselfish endeavor to enrich and beautify the city, a spirit which has borne fruit in the construction, ornamentation and equipment of a building which will serve an increasingly important purpose in affording to all an opportunity for education, recreation and the appreciation of the arts, a spirit whose reward is that most lasting of all monuments, the well-deserved gratitude of a body of citizens, not for the present merely, but for all time, a spirit which will ever serve as a guide and inspiration to all truly public-spirited citizens in the years to come; and be it further

"Resolved, That these resolutions and preamble be spread upon the minutes of this meeting and that a copy of the same be presented to M. H. de Young.

HERBERT FLEISHHACKER, President

JOHN A. McGREGOR — A. B. SPRECKELS

M. EARL CUMMINGS — WILLIAM HUMPHREY

Park Commissioners of the City and County of San Francisco

JOHN McLAREN, Superintendent — JAMES DE SUCCA, Secretary

—S. F. Chronicle, January 20, 1921.

HON. M. H. DE YOUNG
Founder of Memorial Museum.

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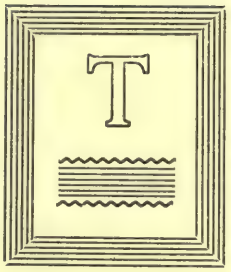
THE M. H. DE YOUNG MEMORIAL MUSEUM

THE STORY OF SAN FRANCISCO'S TREASURE HOUSE AND ITS CONTENTS

By MARJORIE C. DRISCOLL



HE story of the San Francisco Memorial Museum, rising among the trees of Golden Gate Park, goes back to a day in the summer of 1893, when to M. H. de Young, in Chicago as National Commissioner at large to the Columbian Exposition, there came the idea of a similar exposition for San Francisco. Out of the inspiration of that day grew the California Midwinter Exposition of 1893 and 1894, and out of the Midwinter Exposition grew the Memorial Museum.

The history of the Museum is very largely, particularly in its early years, the history of Mr. de Young's determination to carry through his splendid project, his refusal to be daunted by discouraging circumstances, and his magnificent and continued generosity to the institution he founded.

It was through Mr. de Young's initiative and under his direction that the balance remaining from the Midwinter Exposition was expended in the wise purchase of exhibits to be installed in the first museum building. The principal buildings of the group of three, the unit begun in 1917 and that completed in the fall of 1920, are his gift. How many thousands of dollars he has personally spent for rare treasures to be installed in the museum galleries, no one knows, not even Mr. de Young himself, for very early in his career as a purchaser and donor he formed the habit of keeping no record of the amounts expended on his collections lest, as he himself says, the sight of large totals in cold black and white could chill his enthusiasm and, perhaps, hold him back from the purchase of some desired article. The labels affixed to the exhibits tell the story, however, and the visitor to the museum is quickly impressed with the fact that there is no room nor gallery, nor even a class of exhibits, to which Mr. de Young has not been a generous contributor, many times the principal donor.

Story of Midwinter Exposition

How the Founder of the Memorial Museum Came to Be a Collector—His First Plans for Commemorating an Important Event in San Francisco History—the Growth of the Collecting Habit—the Work Involved in Gathering Articles for Exhibition—Mr. de Young Relates Interesting Experiences.

Mr. de Young was appointed National Commissioner at large to the Chicago Columbian Exposition in 1893, the appointment coming from President Harrison. Shortly afterward he was elected vice-president of the National Commission.

Fulfilling his duties in this position, Mr. de Young was brought into close touch with many foreign exhibitors and he found them most favorably disposed toward his plan for a California exposition, to which they might send their collections. With this encouragement, he called a meeting of Californians then in Chicago and at the same time began a campaign in San Francisco to arouse enthusiasm for the plan.

Expressions of interest and willingness to aid came from the Governor of California, the Mayor of San Francisco and from the general public, stimulated by the support given by the press. But the year of 1893 was a period of financial depression and many San Francisco business men feared to embark on an enterprise that promised to be such an expensive one. Notified of this attitude, Mr. de Young immediately telegraphed his personal subscription of $5000 and new life was given the campaign in San Francisco.

Meantime, on June 11, 1893, the Californians in Chicago held their meeting at the call of Mr. de Young. Foreign exhibitors pledged their support in sending exhibits to San Francisco. Subscription lists were circulated and a total of $41,500 was pledged.

Although the San Francisco public was by this time heartily in favor of the plan, there was still considerable doubt in the minds of the cautious business men who made up the Western committee. Unwilling to proceed without convincing proof that they were taking no serious risk, they appointed a special investigating committee of fifty members. The committee considered the de Young plan from all angles, went over in detail the estimates and suggestions submitted by Mr. de Young, and finally recommended to the general committee a plan for permanent organization, the principal feature of which was a proposition to erect on land in Golden Gate Park, four buildings, the aggregate cost not to exceed $500,000.

This was the material with which Mr. de Young had to work when, in the summer of 1893, he returned from Chicago and was immediately named president and director-general of the proposed exposition. To assist him, a State advisory board was named, including

representatives from Northern and Southern California, sub-committees were formed and active work was started.

Mr. de Young's original idea had been to erect one building on a twenty-acre plot. Realizing that one building and twenty acres would be entirely inadequate to give space for the quantity of exhibits already in sight, he startled the Park Commissioners by a request for 200 acres.

Golden Gate Park was then very largely a barren waste of sand hills and thickly growing chaparral, not yet planted to the luxuriant masses of trees, flowers and shrubbery that cover it today. Long debate on the part of the Park Commissioners finally resulted in the grant of Concert Valley, a section of the desired size, but an unattractive and unbeautiful array of sand hills on which grew sparse underbrush. Concert Valley was given for exposition purposes on the understanding that it should be returned in such shape that permanent improvements might be carried out as planned by the Commissioners.

August 24, 1893, was the day of the ground-breaking. A parade moved to the designated spot, an unusual parade, for in the line of march were teams, grading wagons and workmen in their working garb. As the closing words of the dedicatory speech were spoken, the first team and the first gang of workmen moved into the grounds, and, by the time the crowd had dispersed, the work of grading was going ahead at full speed.

January 1, 1894, was set as the opening date, leaving only four months to get ready. The plans called for four principal buildings, surrounding the Grand Court of Honor, buildings devoted to Manufactures and Liberal Arts, Horticultural and Agricultural, Mechanical Arts and Fine Arts, the last named of which was to become the nucleus of the museum. In addition to these were the Administration building, Festival Hall, county and State buildings, buildings erected by foreign exhibitors, including the famous Royal Bavarian Pavilion, the Chinese building, the Japanese tea garden, still in operation, and the Midway.

Although it was found impossible to open the exposition on January 1, as planned, the ceremonial opening did take place in January —on January 29—with a spectacular parade and elaborate opening exercises.

On the first day the attendance was registered as 72,248. Between January 29 and July 4, the period of the exposition, the total attendance was 1,315,022.

Unique among world's fairs, the Midwinter Exposition closed with a financial balance in its favor. After meeting all expenses, providing for all prizes, certificates and other matters, and completing its work, the fair showed a balance on hand of more than $75,000. This, with the improvements made at Concert Valley, reached a total of $194,051.49, and this sum was turned over to the Park Commission. It was decided to permit the Fine Arts building, the Egyptian structure that forms part of the present museum group, to remain, and in accepting the gift the chairman of the Park Commission said:

"In years to come this building will remind our people that in the years 1893 and 1894, in the midst of almost unprecedented financial depression, an industrial exposition was here projected and carried to a successful termination."

It was because of this thought that the museum, which finally grew out of the exposition, was named the Memorial Museum; not a

memorial to any person or persons, living or dead, but to the Midwinter Exposition.

The final disposition of the Fine Arts building and the money remaining from the exposition was uncertain for some time, until the exposition directors decided to place the matter in the hands of Mr. de Young, who had served as director-general of the exposition, to use the building and the money for the benefit of San Francisco in whatever way he saw fit.

Immediately Mr. de Young decided that a museum should be created, and immediately he found himself in another struggle to convince the Park Commission that his idea was practical. The formation of collections was no new idea to him, however, for his thought of such a collection for the education and recreation of the city was far older than the Midwinter Exposition.

"Most intelligent men and women," he said in his own account of the founding of the museum, "go through life with fads, some for literature, some for art, some for gathering things. When I was a young man, and my business as a newspaper man took me to many places and many stores, I acquired a fad for antiquities, but I did not have the money to buy them and I passed along.

"I do not know how I got the fad, but I began by collecting stuffed birds. I had more than 300 of them. Then, in the course of time, I went to an auction and bought a large collection of Chinese carvings. I had to take the birds out to make room for the carvings, and I thought I would give them to the city. I told the Park Commissioners about it, and they laughed. They would not take them, and at last, for there was no room in my home for them, I had to put the birds up at auction. The auctioneer returned me $56 for a collection that cost me $600. Never to this day have I forgotten that $56. It burned a hole in my brain. I did not want to dispose of them. I wanted to keep them. That is where I got the museum bug.

"Years after that, when we held the Midwinter Fair and it was seen that the proceeds were going to show a profit, I told the directors that I was going to create a museum in the Park with the money. The next thing was a building. I sought the distinguished gentleman at the head of the Park Commission, Mr. Stow, and he told me that we could not leave any building in the Park. He said that a museum did not belong in the Park. That made me angry. I said:

" 'Every great museum in the world is in a park. In Central Park in New York, the great Metropolitan Museum is on one side and the Museum of Natural History on the other. The great British Museum is in Bloomsbury Park; the great South Kensington Museum is in Kensington Park, the Louvre is in a park, the Berlin Museum is in the Thiergarten, in Vienna the great museum is in Prater Park.'

" 'All right,' he said. 'Your argument is good. Put your museum in the Park if you want to.'

"I knew what I was about when I insisted that the museum should be in the Park. Art buildings, museums, or any kind of exhibitions which are in the heart of a great city, down where the business is conducted, do not attract the multitude. When the people have a little leisure time, they do not go downtown, where the streets are dead and where there is no life. They go to their parks. And that is the logical place for a museum.

"I was in New York one Sunday and started to wander around to see the various places of interest. I went out to Central Park, where are located the Metropolitan Museum and the Natural History

Museum. I found them both crowded. I went to the New York Historical Museum downtown and there I found just three people. At another downtown museum I found no one at all.

"This shows the natural tendency of the people. When the stores are closed, they do not want to go down into the town; they want to go to their parks, where there are all kinds of amusements, where there are big grounds and grass and trees and small lakes of water and things of interest to see. If there are also places of interest, which are educational, like our museum, they flock there.

"The Memorial Museum and the Academy of Sciences are located in our Park, and inquiries show that more people visit these two places on Sundays than any other place of interest in San Francisco."

Once given permission to go ahead with his project, money to spend on it and a building as a nucleus, Mr. de Young made another discovery. He was told that museums could not be created to order and that the Pacific Coast, far from art centers and places where the historical treasures of antiquity could be found, was an impossible location for a museum. The latter statement he proceeded to disprove, but the first warning he found was quite true. However, with faith that the people of San Francisco wanted a museum and would support him in his efforts to build one, he went ahead.

"I found that museums don't grow in a day," he said in a speech to the San Francisco Club in 1918. "The great museums of Europe took hundreds, sometimes thousands of years to grow to what they are now, and I found, after I started my task, that it was hard, slow work.

"When I began my excursions into the byways of San Francisco, I was astonished at the number of interesting things, sometimes whole collections, that I found. In New York I went through the curio shops, second-hand stores and odd corners. There, too, I went to Tiffany's and there my education in museums went several steps ahead. My training in museums went along step by step, like a baby's education in life. When I thought that I knew a good deal about them, I found that I didn't. At Tiffany's I learned some more.

"Upstairs there I found a collection of old armor and other things that had come from the Chicago Exposition. One case held a collection of knives and forks that went back almost to the days of Adam and Eve. With my chest all swelled out, I said to the man in charge that I thought of buying this case.

" 'That will be sold at a reasonable price,' he said. 'Only $80,000.'

"At once I knew that I had something to learn about collecting. So I determined to learn it, and I took the man to luncheon.

" 'Tell me seriously,' I said, 'why those knives and forks are given such a price as that. They never cost that much.'

" 'Of course not,' he said. 'You don't understand the museum game.'

" 'I do not,' I said, 'but I'd like to.'

" 'Why, the man who made this collection devoted fifteen years or more to getting it, going from country to country and searching indefatigably. Now if you or anyone else wants a collection of knives and forks, you must either buy this, and pay for the work of those fifteen years, or make it yourself.'

" 'I see,' I said, and to myself I added, 'I can't afford to buy collections, but I've got a good long lease of life ahead of me and I'll make them myself.'

"One of the first collections I made was the collection of knives and forks now in the museum.

"Now I have the collection habit. If I am to stay over between trains for no more than an hour, I go into the antiquarian stores and poke around, and, as often as not, I find something of worth."

The auction rooms of Paris have been the hunting ground where Mr. de Young captured a great number of the hundreds of exhibits that bear his name. Visiting Paris year after year and attending the great sales held there, Mr. de Young is known as one of the shrewdest and most untiring buyers of all those who flock to the auctions. Curiously enough, only a very few of the dealers and rival buyers know his name, for, although he has attended many auctions, he transacts all business details through a French house and his name does not figure.

How his education in museums was continued in Paris was interestingly told in a speech given by Mr. de Young some years ago for a San Francisco club.

"When I went to Paris to buy for the museum I found that I still had much to learn," he said. "The first thing I priced at an antique shop was an ivory urn. Ivories at that time were selling at reasonable prices, but the dealer asked me 6000 francs for the piece —the beautifully carved vase which for years has been one of the finest pieces in the Jewel Hall ivory collection.

"It seemed to me that 6000 francs was rather too steep a price, although the vase was a very fine piece, and I began to wonder how much the dealer had added as his own profit. I said to myself: 'I am as good a business man as these antiquarians, and why shouldn't I buy where they do?' I was told that they bought at the Hotel Drouot, the great Parisian auction mart, conducted under the most rigid rules.

"The next morning I wandered down to the Hotel Drouot. I asked many questions, but I did not get much information. I saw the building and it was very interesting, the institution was interesting and the system was interesting. There were numerous rooms for auctions. Downstairs they sold the things of lesser value, old mattresses, cheap furniture and the like. But upstairs were ten or twelve large halls, each with a number. That was where they held the auctions of fine things—the museum things—the things of value. And every morning these rooms were filled with exhibits. They have an auction in four or five rooms one day and the next day they have auctions in another set of rooms. There are printed lists, stating where the different things are sold—in one room the engravings, in another the carpets, in another the paintings and so on. I found that while the seller had to pay the auctioneer, the buyer also had to pay the auctioneer for the privilege of buying.

"The auctions are held in the afternoon, never in the morning, which is very convenient for people who believe in taking life easily and having breakfast at noon.

"A Paris friend of mine and I strolled down to one of these sales. It was a sale of splendid things, a regular museum in itself.

"They had a long table running through the room, around which the buyers sat. There was an expert in charge. He is a government official and is responsible for giving the buyers an accurate report on the authenticity of everything put up. He will hold up an old chair, for instance, and say: 'This is genuine Renaissance. It has one new leg and the cover is new, but the rest is genuine.' You accept his report as correct. If you buy something on his recommendation and later find that it is spurious, you are entitled to take it back and the expert is responsible.

"One thing about the sales is puzzling to the new buyer. You never know whether the man in charge will start with the first article on the list or the last one. Naturally he has friends among the buyers and very often there are previous agreements that certain articles will be held until late in the day or put up early before the crowd gets there. Never did they go by the catalogue. The auctioneer would jump from one to ten, from eight to forty-nine or to any other number he wished. You could not tell when he would get to the articles you particularly wanted; the only thing to do was to arrive early and wait patiently.

"On that particular occasion I was after six marble busts of Roman emperors, the six that now stand in Statuary Hall at the museum. My friend and I waited all the afternoon, while the auctioneer put up first one thing and then another, but never the busts I wanted. At last my friend had to leave, but I stayed. It was then that he told me to give his name as security and to order whatever I bought sent to his establishment. I did so, and have done so ever since. They do not know my name at the Hotel Drouot to this day.

"There were only eleven people left when the auctioneer brought out the things I was after. The bidding ran up 50 francs at a time, but at last I got the busts. I had learned how to manage at a Paris auction.

"Two days later dealers were offering me double what I had paid for the busts, but I would not sell. I never will sell anything I buy, because I know what I want and buy only that.

"I tell you this that you will see some of the trials and tribulations I have had trying to get things for the museum. It is anxiety to get things. There is no end to its desire for more and more."

Founder's day for the Memorial Museum falls on March 23. It was on March 23, 1895, that the building and exhibits were turned over to the Park Commissioners, in whose hands the administration of museum affairs has since rested. There was one building, the small Egyptian structure that now forms the easternmost of the three in the museum group, and had formerly served as the Fine Arts building for the Midwinter exposition. Annexed to this with connecting galleries, but, from the outside, forming a distinct unit, was an unusually interesting small building of three rooms—the Royal Bavarian Pavilion, also a Midwinter Exposition inheritance.

Since one of the objects in creating the museum was to make it a memorial to the Midwinter Exposition, the first purchases were naturally among the most valuable and important collections of that exposition. Notable among these were the "Cider Press" bronze, which, although not strictly a museum exhibit, stands directly opposite the old building, and the great Dore vase, "The Vintage."

Mr. de Young continued to make purchases, including an extensive collection of antique and modern bronzes, many articles from the Oriental exhibits, and the nucleus of the present splendid collection of ceramics, embracing fine specimens of Sevres, Doulton, Royal Worcester, Dresden and other European wares, and a large number of Oriental pieces. The beginning of the present collection of Indian and South Sea exhibits was also made at this time. Other purchases included a considerable number of Egyptian and other antiques, jewelry, objets d'art, coins, miniatures and mosaics, examples of art metal work, ivories, a part of the present Napoleon collection, furniture, tapestries, weapons and other trophies, plaster casts, wood carvings, musical instruments, minerals,

watches, etchings and sketches, paintings, historical documents, natural history material and other exhibits.

Several months after the close of the fair Mr. de Young went to New York, and there was fortunate enough to secure at a sale a collection which the New York Times then declared editorially was "of greater value artistically, instructively and in point of curiosity and scope than is possessed by many cities which have long had public museums."

The collection included armor, gems, bronzes and glass. The armor came from the famous Zschille collection, which was offered to the Metropolitan Museum of New York for $580,000. The portion purchased by Mr. de Young consisted of fifteen complete suits of the period from 1450 to 1620, and other specimens such as swords, halberds, helmets and pikes. The purchase was made at a time when the country was still in the throes of financial depression, and consequently Mr. de Young, coming forward at the psychological moment, was able to obtain this valuable collection at an exceedingly reasonable figure, many times less than its actual value.

At this time the museum also acquired the collection of Napoleonic medals, several hundred medals and coins commemorative of the emperor, which is said to be the most complete of its kind outside the great French museums.

The first addition to the museum came about a year after its opening, when several additional rooms in the rear of the main buildings were opened as art galleries and for other exhibits.

For nearly twenty years the museum remained in its original quarters, with the cry for space becoming more and more urgent. Valuable and interesting exhibits were forced into storage for lack of room; every gallery was filled to overflowing. George H. Barron, who served as curator from 1910 to 1917, said of those years:

"Growth was slow at first. The Memorial Museum in its early years had practically only one contributor, M. H. de Young. He gave constantly, and built up in those years some of the museum's most valuable collection. He spent his time and his money freely, traveling over Europe and employing his experience to gather, bit by bit, collections of various kinds that if bought outright would have cost prohibitive sums.

"Immediately following the fire of 1906, the museum began to grow by leaps and bounds. Realization then came that an immense wealth of material relating to the early history of California and San Francisco had been destroyed by the fire, and that it was due to the people of California to save what was left from ultimate destruction.

"Therefore, the Pioneer room was established and every effort bent to the collection of Californiana from every possible source. Mrs. Eleanor Martin presented the Oriana Day collection of paintings of the California missions; the Vallejo heirs gave their treasured relics of the days of Spanish-California; the Sutter heirs came forward with their collection from Sutter's Fort. Hundreds of members and descendants of pioneer families sent contributions. Upon the installation of these, the popularity of the museum became great and the daily attendance rapidly increased.

"In 1912, with the congestion of every room and section, the problem of space became a pressing one. Complaints came from many donors that their gifts were not exhibited. I made the condition known, believing that the public-spirited citizens of San Francisco would estab-

lish a museum to relieve this congestion of collections. Response came from Mr. de Young."

The result of these conditions was the announcement by Mr. de Young on March 25, 1916, of a building project of magnificent scope. Louis Mullgardt, architect of the Panama-Pacific Exposition, was commissioned to prepare plans for an addition to the museum, so extensive and important that it overshadowed the original building and became, instead of an addition, the principal portion of the group. That building is now the central one of the group of three.

In designing the new building Mullgardt established the scheme for the ultimate plan of the museum. He chose an architectural style of the Spanish Renaissance type, adapted from sixteenth century designs to meet present-day demands. Instead of the small rooms of the old unit, large galleries were planned. Skylight lighting was used throughout.

The corner stone of the new unit was laid April 15, 1917. In a speech given at that time Mr. de Young said:

"I have now placed this stone and box where they will remain for years and years, until the destruction of this building by God or man, and in doing so I dedicate this building to the people of San Francisco as their property, to be managed by the Board of Park Commissioners and under their control.

"There is only one museum in San Francisco that is yours. The others are conducted by private individuals, but this museum belongs to you, and is placed in the people's playground. It is in charge of your officers and shall always remain there, and no man can disturb it. I shall have no more credit after I am dead than you shall have. It belongs to you.

"I ask God to bless it and shower his kindness upon it, and I hope that it will grow and develop until it attains a plane with other great museums of the world."

Formal transfer of the new building and its valuable contents was made to the Park Commissioners by Mr. de Young in February, 1919, when the building was finally completed and the exhibits installed. The deed of trust, dated February 22, 1919, contains the following paragraphs:

By the Grace of God, in the name of humanity and education, this Deed of Trust is made in the Year of our Lord, Nineteen Hundred and Nineteen.

WITNESSETH:

"I, M. H. de Young of the city and county of San Francisco, State of California, as a token of my deep love and affection for this city and its people, do hereby give and grant, alien and confirm unto Curtis H. Lindley, John A. McGregor, M. Earl Cummings, Sigmund Greenbaum and A. B. Spreckels, members of and constituting the Board of Park Commissioners of the city and county of San Francisco, State of California, and to their successors in office forever, all of my right, title and interest in and to that certain building known as the new Memorial Museum, which I have caused to be erected in Golden Gate Park in said city and county, and to each and every and all of the contents in this and other attached buildings, consisting of various and sundry oil paintings, water colors, statuary, European and Oriental antiques and handicraft of all kinds, including various ceramics, armors and textile fabrics, also silver and gold exhibits, precious stones, coins and medals, which I have caused to be placed and installed in said building.

"To have and to hold the same in trust, nevertheless for the uses and purposes and with the powers hereinafter mentioned, namely:

"First, to keep and insure and maintain the said building and the said contents therein as a museum for the free use, benefit and enjoyment of the people forever:

"Second, if by any changes in the laws, the jurisdiction or control of the said Curtis H. Lindley, John A. McGregor, M. Earl Cummings, Sigmund Greenbaum and A. B. Spreckels, or their successors as members of the said Board of Park Commissioners, over said Golden Gate Park shall pass to any other board or body of persons, to execute any instrument or do any act necessary or requisite to transfer said building and said contents therein to said other board or body of persons, in trust, for like uses and purposes and with like powers:

"Third, the principal condition being that all my gifts are to be for all time maintained in this and connecting buildings in Golden Gate Park. That they are not to be removed or loaned. The building is to be opened every day in the year. There shall be no charge for admission."

Any deviation from the conditions of this Deed of Trust shall act as a forfeiture, and all the property so given shall revert to me or my heirs and assigns.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this twenty-second day of February, A. D., 1919.

M. H. DE YOUNG [Seal]

Signed, sealed and delivered in the presence of
PERCY E. TOWNE [Seal]

Under these extremely generous conditions the Memorial Museum prepared to advance to even greater possibilities of usefulness and interest. Almost the first step was the discovery that still more room was needed.

The Museum Buildings

The Original Midwinter Exposition Gallery—the New Structures Provided by M. H. de Young—Spanish Renaissance the Style of Architecture—a Sylvan Setting—a Magnificent Main Portal—Doors of the Museum Rarely Closed—Efficient Staff in Charge.

Mr. de Young promptly met this condition with the announcement of another building project. The first new unit was scarcely completed when plans for the next were under way. Again Louis Mullgardt was called in as architect, and designed the magnificent new unit opened in the fall of 1920, the unit which, with its great central tower and corresponding in architecture to the 1917 unit, is to form the main building of the group and the entrance to the museum.

Planned in units and with the wide spaces of Golden Gate Park as a setting, the Memorial Museum has almost indefinite possibilities of growth. No city streets hedge it about and restrict its development. Its future extent and importance are conditioned only by the means at the disposal of the governing board and the support given by the public.

The museum group as it stands at present contains forty-five main exhibit galleries, ranging in size from the tiny jewel-like Napoleon room to the spacious Statuary Hall and the corresponding armor room, each 140 by 48 feet. In the 1920 unit, through which entrance is gained to the building, are five art galleries, the armor hall with its splendid collection of war relics, two rooms devoted to textiles, and the mineral, coin, jewel and musical instrument collections.

The 1917 unit, or the central building, has for its central gallery Statuary Hall, with an excellent collection of marbles and bronzes. In addition there are four large art galleries, a room devoted to plaster casts, the Oriental room and two galleries of ceramics.

The remaining collections, including the Napoleon relics, furniture, historical exhibits, Mexican antique and native material, nautical exhibits, Indian basketry, South Sea Island, American Indian and other native material, Egyptian and Pompeian collections, antique Greek statuary, ecclesiastical material, art metal, Colonial, and the unique and valuable pioneer and mission collections, are housed in the original building, with the Natural History Department at present occupying the mezzanine floor.

Architectually the buildings present an interesting study. They stand in their own carefully landscaped gardens, to which John McLaren, superintendent of Golden Gate Park, has devoted much thought. The original building is strongly Egyptian in style, with two pyramidal towers, heavily buttressed walls, and lavish carvings and modeling in Egyptian characteristics. The capitals of the columns are in lotus leaf design, and the friezes that decorate the building are carved with hieroglyphics and figures copied from Egyptian paintings.

The principal buildings are in Spanish Renaissance design, especially well adapted to their California setting. The brightness of the

California sun upon them is tempered by their coloring, a subdued salmon tint, with decorative material in ivory tones. Richly molded portals in heavy outline adorn the south face of the buildings, connected by bands of ornament along the top of the walls. The cornice decoration is rich and effective, and the pillars at the entrance doors are heavily molded.

The first new unit is 510 feet long and 140 feet deep. The second new unit is of corresponding size, and the two units are connected by spacious corridors, large enough to be used as art galleries, with the great central tower, 134 feet high, rising over the entrance, which is on the corridor between the main buildings. Each wing of the first new unit has a floor space of 23,800 square feet, divided into rectangular galleries. Over each gallery is a skylight, and the central halls are lighted by continuous skylights, extending over their entire space of 140 by 48 feet. H. J. Brunnier, consulting engineer, devised the ingenious scheme by which the arches that support the central halls are built without visible tierods or supports, leaving the great sweep of the hall clear from end to end.

The K. E. Parker Company very successfully fulfilled the important post of contractors for the construction of the buildings.

A notable feature of the two Spanish Renaissance units is the sculpture which adorns the buildings. Haig Patigian, San Francisco sculptor, designed the splendid group of figures placed over the entrance archway, with Leo Lentelli contributing to the further adornment of the buildings.

The sculptured groups over the main entrance door are worthy of study. Crowning the arch stands Superior Intelligence, typified by a figure of great dignity and beauty. Below, on either side of the arch, are four winged figures of symbolical nature, Music and Painting on the left and Architecture and Sculpture on the right. Within this arc of symbols is the tympanum, another group of symbolic figures centering about Science and Industry.

In the tympanum group, Knowledge is typified by the seated figure in the center, holding the book of wisdom in the right hand and a skull in the left. On the left of Knowledge sits Science, represented by an old man holding a scroll and contemplating a lighted brazier. On the right is Industry, a young man leaning on a hammer that rests on an anvil, his outstretched right hand holding a cogwheel. In the background of this group are two standing figures, Education on the right, holding a torch, and on the left, History, holding a scroll.

Placed on the pedestals below the tympanum are four supporting figures, a man and woman in costumes of pioneer days flanked by Spanish padres. Below each of the latter figures, and forming the basic groups of the design, stand the figures of two men, the Discoverer and an Indian.

The entire composition tells the story of the progress of California, beginning with the aborigine and the explorer, through the days of the missions, the pioneers, and finally the development of the arts and industries, to the crowning figure of Superior Intelligence.

Between the figures of the pioneers and the padres are three tablets with the following inscriptions:

"Honor of State depends upon every individual."
"National honor depends upon honor of State."
"World happiness depends upon honor of Nations."

Approach to the main entrance is through a landscaped parkway and past the Pool of Enchantment, a charming little pool set in feathery shrubs and flowers, on the brink of which stands the spirited figure in bronze of an Indian boy. Two bronze panthers crouch on the opposite side of the pool. M. Earl Cummings, sculptor and Park Commissioner, designed the pool and executed the bronzes.

Directly opposite the main entrance door are the museum offices and library. Two excellent moose heads and two buffalo heads adorn the walls of the entrance corridor.

The lighting of the new buildings is managed altogether by skylights. There are no windows in the buildings, with the exception of those in the offices. Glass-topped cases to hold such displays as the ceramics exhibit further assist in showing every article to the best advantage.

An unusually complete system of labeling exhibits is followed in the Memorial Museum. Each article has its individual label on a printed card, giving the name of the exhibit, its date if it is an antique, its location as to country, the name of the donor, and frequently a bit of interesting history.

Six curators have served the Memorial Museum since its opening. C. P. Wilcomb, appointed at the beginning, held the position until 1905, when he resigned and was succeeded by John W. Rogers. Rogers resigned in June, 1908, and was followed by Albert E. Gray. The next curator, George Barron, assumed his duties in March, 1910, and served until the spring of 1917. William Altman, his successor, died in November, 1917, after only a few months in office, and Charles E. Penez, the present curator, was appointed.

The excellent start given the Natural History Department is largely due to the foundation laid by Ferdinand Gruber, who came to the museum from Woodward's Gardens, a famous old resort and museum of pioneer days. Gruber died in 1907. The present head of the Natural History Department is Robert Belmont.

The Memorial Museum has been most fortunate in the infrequency with which its doors have had to be closed to the public. Only three times in its history has it been closed for more than a day; once in the summer of 1896 for a few weeks while exhibits were being transferred to new rooms and installed there; once from April, 1906, to November, 1907, after the disastrous fire and earthquake of 1906, which did considerable damage to exhibits, and once in the fall of 1918, when the influenza epidemic made necessary the closing of all places of public resort. The tremendous task of installing the exhibits in the 1920 unit and rearranging the old rooms has been carried out without closing the museum for a single day, under the executive management of Charles E. Penez, the Curator, and his efficient staff of employes. Except for the wooden barrier shutting off the new unit and the dismantled condition of a few of the old rooms from which exhibits have been moved, no indication has been given the public of the great task being accomplished.

Practically all the installations now in place owe their arrangement to Curator Penez, who came to the Museum before the work on the 1917 unit was completed. Under his capable direction the nine galleries of the central unit and the eleven galleries of the newest unit have been entirely installed, and the contents of practically all the galleries of the old building rearranged.

In the work the curator has had the assistance of the regular staff of the Museum. Members of this staff at present are Mrs. Solly

Walter, Miss Elizabeth Holmes, Miss Nellie Lyons, Miss Genevieve Kerwin, Mrs. Fred Hooke, Mrs. O. Severance, Mrs. Ann Hoffman, Mrs. Jennie Peterson, Mrs. Alice Lee, Mrs. Dorothy Smith, Mrs. Frank Morrison, Charles Clanton, Robert Belmont and Edward Dennis.

The museum has also been fortunate in suffering only moderate loss from earthquakes and other disasters, and practically none from theft. In April, 1898, an earthquake shock broke a few vases and pieces of glassware, but nothing of special value was injured. The great earthquake of 1906 had more serious results, but the greater part of the statuary, porcelain and other damaged material was repaired with the utmost care and skill, and probably not one out of a thousand persons who inspect certain exhibits today realize that the morning of April 18, 1906, found these exhibits in shattered fragments. A porcelain vase or bowl here and there shows the branching cracks and lines where it has been repaired, but the majority of the restored pieces were so well handled that it takes a close inspection to prove it.

Only once was an object of very great value stolen from the museum. This was in March, 1910, when a painting, "The Shepherd and His Flock," by Millet—a small canvas 17½ by 21⅞ inches and valued at $15,000—was cut from its frame. A young art student was later arrested and charged with the theft. He declared that he had taken the picture because of an irresistible desire to have it constantly before him as an artistic inspiration. Believing his story, certain San Francisco philanthropists interceded for him, obtained his release on probation, and he was given a place as janitor in a studio, where he might study art during his spare time.

The Millet was excellently restored to its original frame. It is, however, no longer in the museum, since it was one of the original Sarah Spooner collection, a gift made to the museum by bequest of Miss Sarah Spooner, a wealthy collector, and contested by relatives, who attacked the will under the law prohibiting the bequest of more than a certain percentage of estates to public institutions. Mrs. Emily Potter, the sister who instituted the contest, later agreed to a division of the pictures which formed the most valuable part of the collection, and, when the division was made, further agreed to leave her share of the paintings in the museum for an indefinite time, withdrawing only the Millet and a painting by the elder Dupre.

In addition to single objects, the museum contains a large number of valuable collections, representing the work of years on the part of their makers. Such collections as the Nuttall laces and embroideries; the Ney Wolfskill netsukes (Japanese carvings); the Bardwell Oriental material; the Morton Mitchell collection of miscellaneous objects; the Sarah Spooner collection, including pictures and many miscellaneous articles; the Ernest Forbes Mexican material; the Martin Indian collection; the Thomas Bishop collection of Indian stone implements which the Smithsonian Institution tried vainly to obtain; the Boggs, Daggett and Cook basket collections; the Newton Booth jewels; the Kunz gems; the Biddle Oriental material, and many others, are world-famous. Besides these, the enormous number of gifts made by Mr. de Young includes hundreds of collections, such as the Claxton tea caddies and bowls, bought outright and presented as a whole.

In fulfillment of a trust created by Mary A. Burke to perpetuate the memory of her husband, Frank H. Burke, and his father, Martin J. Burke, liberal contributions were given to the founder, M. H. de Young, toward the erection of the tower.

The largest and most famous piece of modern bronze casting. Gustave Dore's two years' work entitled, "The Vintage." Valued today at $250,000.
Statuary Hall.

A Popular Institution

It Houses More Than a Million Objects in Forty-five Galleries—the Growth of the Museum—the Wisdom of Placing It in the Park—It Has Become the Holiday Resort of the People of San Francisco—a Greater Attendance Record Than Any Other Museum in the Country.

In number of exhibits the Memorial Museum shows a steady and constant growth. Beginning with about 6000 articles on display in 1895, the collection leaped to 40,000 by the end of 1896, 50,000 by 1900, 57,000 by 1903, and so on, until now the buildings house more than one million articles, valued at many hundreds of thousands of dollars. Many of the exhibits are practically unpurchasable at any price, and there are numerous single exhibits, statuary, tapestries, pictures, antiques and so on with individual values ranging from $20,000 up.

One of the most distinctive features of the Memorial Museum is the splendid attendance record. The skeptics of 1893 who told Mr. de Young that a museum could not possibly be established on the Pacific Coast would doubtless have declined to believe predictions that the Memorial Museum would, from its very beginning, compete with older and larger institutions in the matter of attendance, attract more visitors yearly than the famous Smithsonian Institution in Washington or the Field Columbian Museum of Chicago, and actually equal the New York Metropolitan Museum in yearly records. The wisdom of Mr. de Young's insistence that the museum be placed in the park, the holiday resort of the crowds, is shown in the attendance figures. Every Sunday and every holiday sees a tremendous jump in attendance. A Sunday record of 6000 persons viewing the exhibits is not at all out of the ordinary, and several times the holiday attendance has gone over the 20,000 mark.

Attendance figures were taken in the earlier years of the museum by recording turnstiles placed at the entrance. These were later removed, and the attendance is now checked by a member of the museum staff with an automatic register. The official records of the museum show the following figures:

Opening day, March 24, 1895	11,184
Year ending March 23, 1896	500,823
March 24 to December 31	272,352
(Museum closed for alterations, September 13 to November 21.)	
Year of 1897	471,777
Year of 1898	371,192
Year of 1899	372,074
Year of 1900	272,992
(Recording turnstiles removed from August 1 to November 2.)	
Year of 1901	502,650
Year of 1902	452,391
Year of 1903	445,832

Year of 1904.....424,510
Year of 1905.....413,410
January 1 to April 18, 1906.....117,854
(Museum closed until November 10, 1907; earthquake damage.)
November 10 to December 31, 1907..... 66,802
Year of 1908.....498,013
Year of 1909.....375,474
Year of 1910.....579,049
Year of 1911.....579,321
Year of 1912.....571,907
Year of 1913.....580,721
Year of 1914.....582,328
Year of 1915.....722,621
(Panama-Pacific Exposition held during 1915.)
Year of 1916.....500,372
Year of 1917.....502,650
January 1 to October 18, 1918.....374,491
(Museum closed, October 18, November 29, influenza epidemic.)
Year of 1919.....728,246
January 1 to October 30, 1920.....577,851

Mr. de Young has voiced his ambition for the Memorial Museum in these words:

"I have been thinking how much the growth of the museum is like that of a child. The father and mother watch it with love. The baby begins to creep, and there is joy in the household. The baby begins to walk, and its achievement is a matter of pride. He begins to talk, and his parents are happy. He grows to boyhood and then to manhood, always surrounded by the love of his father and mother.

"I like to gaze away ahead, and when I stood out there, looking at the new building one day, I said to myself: 'When this tower is built and the people of the city see the building and the splendid contents, given so generously by the many people who have shown their interest in tangible form, they will appreciate that the best monument one can have is a gift to the new museum.'

"The museum belongs to the people; it is in the people's park, and the officials of the city have charge of it. It is going to exist forever.

"Future generations are going to see that it is taken care of and treasured as an asset which makes this city not a village, but a metropolis. A city must show development and have attractions besides street cars and buildings. No one will deny that the museum has attractions for all, for the boy and girl growing up and the men and women who want amusement and rest and enjoyment.

"I can see it overflowing. I can see the building growing up, enlargements and additions going back to the main driveway. When we are all gone, that museum will cover acres and acres of ground, and our children and our children's children will live to enjoy it."

Galleries Devoted to Pictures

A Large and Representative Collection of Oil Paintings, Water Colors, Etchings, Engravings, Pastels and Other Types—Seven Large Galleries Allotted to Their Display —California Artists Largely Represented—The Samson and Delilah—French Modern School.

For an institution of comparatively few years, the Memorial Museum has acquired a surprisingly large and representative collection of paintings, both oil and water color, as well as a large exhibit of etchings, engravings color prints, a few pastels and other types of pictures. Seven large galleries are devoted to the display of pictures, and some fifty canvases are hung in the spacious corridors that form the entrance to the new building.

Examples of the work of recognized masters are numerous. In addition to a beautiful "Saint at Prayer," credited to Leonardo da Vinci, and certainly worthy of bearing his signature, the galleries contain a splendid D'Aubigny landscape; Julian Dupre's beautiful "Milking Time"; a Benjamin West portrait; a copy of the Rembrandt Peale Washington portrait, done by Peale himself in later years; six of H. J. Breuer's paintings of the Canadian Rockies; two Blakelocks; Paul Emile Jacobs' splendid "Samson and Delilah"; four William Keiths; L. Beroud's "Rubens Rooms at the Louvre"; examples of the old Dutch and Italian schools and an excellent array of Russian and modern French paintings.

California artists are largely represented. In addition to the Keiths, the examples of California art include Jules Pages' "Sur le Zinc," Joseph Raphael's strongly handled "Town Crier," several characteristic Charles Rollo Peters dark-toned landscapes and many other smaller but not less interesting canvases. The majority of the California pictures are gathered in the Skae gallery, where is housed a collection purchased with the $10,000 legacy left to the museum by Alice Skae. Twenty-nine canvases and eight etchings by California artists were added to the museum as a result of this gift.

M. H. de Young is the donor of the greater part of the art collection, his gifts supplemented by many individual contributions. The Spooner collection, representing the legacy of Miss Sarah Spooner, and the Kahn collection, given by George H. Kahn in memory of his wife, Annie Kahn, are the largest groups donated by single givers. C. P. Huntington also gave a number of paintings.

Among the collections bought by Mr. de Young and presented as a whole was the representation of Continental modernists, largely Russian, French, Italian and German, purchased from the collection owned by Frank C. Havens of Piedmont. When these pictures came into the market in 1917 Mr. de Young selected the best canvases to be added to the museum treasures.

Havens, who was ill at the time of the sale, said when he was told that the gems of his collection had gone to Mr. de Young: "I won't

pretend that I was glad to part with the collection, but since they had to go, I am glad they went to Mr. de Young. He is not like the ordinary buyer. He does not want to keep them tied up where nobody but his personal friends and himself can see them. He is giving them to the public, where I myself would like to see them go."

The best of these Havens pictures are found in the large gallery opening off Statuary Hall, where the Tofanari animal bronzes are also placed. Here are the Dupre "Milking Time," Carlton Chapman's "Friendly Meeting," Henry P. Smith's "In Andalusia," "Lady With Flowers," by Jan Van Os, a Dutch painter of the eighteenth century; W. E. D. Stuart's "Trafalgar," a P. T. Heller canvas, "Woodland Retreat," by T. Faulkner; "The Roman Campagna," by Jules Didier; "Bridal Procession," N. P. Pirogoff; "Golden Autumn," G. M. Shluglei; "Fall of the City of Vladimir," Kosheleff; "Premiers Soirs d'Automne," Jules Lanet; "Napoleon's Last Day in Moscow," J. K. Feodoroff; "Morning After the Battle," N. F. Bounin, and "Bacchus and Ariadne," Titian-Vecellio.

Julian Dupre, the painter of "Milking Time," holds many honors for his work, including Paris Salon medals, exposition medals and the Legion of Honor.

The picture portrays a quiet pastoral scene with two milkmaids in peasant garb milking their cows, probably just at the approach of dusk, for the air is luminous with coming darkness and dew. On the horizon are dark groups of trees, indefinitely indicated, but silhouetted sharply against the sky of billowy pearl gray clouds and deepening blue. Directly in the foreground stands a placid Holstein cow in the sober black and white of her family, submitting to the hands of the milkmaid who sits with her back to the spectator. To the left another milkmaid walks slowly forward, carrying brimming pails on the yoke that rests on her shoulders. Behind her is a group of cows.

The color scheme of the picture is wonderfully restful and calm. There are no high colors, even for the luxury of contrast. Grass and trees are deep, rich green, toning into the shadows. The girls are dressed in dull blue and gray; even the touches of white about their costumes are dim and softened. The milk pails shine with a dull luster. Nevertheless, the picture is not somber nor depressing, but quietly peaceful and dreamy. The atmosphere suggests the dew-laden air of early evening.

"Friendly Meeting," by Carlton T. Chapman, is a colorful study of two old three-deckers, with the picturesque rig of long ago, meeting at sea. Boats are putting off for an exchange of visits between ships. The picture is suffused with a rich sunset light, glowing in the sky and touching the water to flame, while the brilliancy of flags brings the ships into harmony with their setting.

Another naval piece is W. E. D. Stuart's "Trafalgar." This is a spirited battle scene, depicting a struggling mass of ships that crowd the canvas. In the center, a battered hulk lurches for the final plunge, and everywhere ships are grappling in the frenzy of the battle. Clouds of smoke sweep across the scene, so that the ships in the background are only dimly seen through the swirling drifts. Broken spars, torn canvas and all the tumult of the sea fight in the days when sea fights were fought with grappling irons out and boarding parties busy, sweep over the whole composition in a whirling fury.

Very different is Henry P. Smith's "In Andalusia." One wanders down a sunny road in Spain, under the shadow of olive trees, past a picturesque Spanish home with its white walls and graceful balconies.

In the distance are tawny hills, luminous with the heat of midsummer, a heat that hovers over the whole scene.

A delightfully humorous little picture by P. T. Heller is "Return from the Tsar's Coronation of Local Leader of the Russian Peasantry.' It is a typical Russian peasant home interior with the rude furniture and dark walls. Seated at the table is the hero of the day, a bearded moujik, who proudly displays a huge portrait of the new Tsar. Crowding about him are the wide-eyed villagers, eager to hear of his wonderful experience.

One example of eighteenth century work finds place in this room, "Lady With Flowers," by Jan van Os (1744-1808). It is a typical old Dutch school picture, heavy in line and modeling and its colors darkened by time.

A very lovely picture is "Woodland Retreat," by T. Faulkner. It shows a forest pool of dark, quiet water, deep in the heart of peaceful woods. On either side of the pool rises a steep bank covered with trees and ferns, and beyond are glimpses of blue sky. The reflections of the overhanging trees seem to quiver in the water and the shimmer of the water's surface is seemingly laid over the beauty of the reflected trees. The water, with its dusky green depths and its pale surface glimmer, is superbly handled.

Jules Didier is represented by "The Roman Campagna," a landscape study showing a dark pool and trees in the foreground and a glimpse of sunny open country beyond, while two women in the costumes of Italian peasants advance under the trees.

A picture of great and curious power is "The Bridal Procession," by N. P. Pirogoff. The large canvas shows a street in a poor Russian village in the dead of winter. Snow covers the ground and the houses that huddle together. Down the street from the church, the gilded dome of which shows in the distance, comes the bridal procession, a pitifully poor affair of one hooded cart drawn by scarecrow horses and a few men who ride and walk beside. Underfoot the snow is melting into slush and mud, and the horses struggle to pull their burden along. All the color of the picture centers in the decorated hood of the cart, a scarlet almost cruelly vivid, and this splash of color is accentuated by the intense point of light that gleams from a taper carried by a man who walks at the right of the cart. The contrast of the blaze of scarlet and the poverty of the procession with its thin horses and its meager numbers is bitterly satiric, while the lofty, scornful gleam of the gilded church dome in the distance gives the final touch. The ugliness of the surroundings is uncompromising; even the handful of villagers who watch the procession incuriously show the touch of poverty. It is doubtful if any one but a Russian could have so completely realized the spirit of the theme.

Another massive painting of the Russian school is Kosheleff's "Fall of the City of Vladimir." This is historical in its theme; the artist served for years as professor of historical painting at the Imperial Academy of Arts in Petrograd. The picture was sent by the Russian Government to St. Louis in 1904 to be displayed at the exposition, hors concours, or not in competition. It was bought by Frank Havens, and in 1917, with other pictures, passed into the hands of Mr. de Young.

The picture shows the last scene in the Cathedral of the Holy Virgin when the Mongol hordes from the East sacked the city of Vladimir, Russia, in 1239. In that century the Great Khan and his Tartar armies were sweeping Europe, and in 1239 they came to the gate of the city of Vladimir.

In spite of the resistance of the Russians, the Tartars took the city by assault. When the end was in sight the Grand Duke Vladimir, Princess Agatha and other members of the court, priests and nobility, shut themselves up in the cathedral, preferring to die in the holy place rather than surrender.

On February 8, 1239, the city's last defenders gave way and were massacred. Bishop Mitrophan, with his coadjutors and priests around him, gave the last sacrament to the huddled fugitives in the cathedral while the Tartars thundered at the gates. As the gates crashed in Mitrophan cried: "Lord, stretch out thy hand and receive thy children in peace."

It is this moment that Kosheleff chose to depict in his great painting.

The picture is a splendid example of composition. At first glance the eye is attracted to the vivid figure of Mitrophan, standing before the altar in full brilliancy of regalia and in a blaze of tapers. From this high light of the canvas the eye is led through the cunningly blended lines of kneeling women, upraised arms, streaming hair and flowing robes, to the pivot figure at the lower right hand corner of the picture—a woman in a somber black robe with a strong resigned face. From this turning point the lines of uptossed arms and figures lead up to the gates where the first of the Tartar hordes, a terrible figure with gleaming eyes and knife gripped in his teeth, bursts through. So effectively is this climax led up to that it is no uncommon thing to hear visitors, viewing the picture for the first time, discuss figure after figure, following the line from Mitrophan through the picture until the demoniac Tartar bursts upon them with an actual shock.

The third great canvas of the Russian school is the somewhat better known "Napoleon's Last Day," by J. K. Feodoroff. This picture was also in the Russian art section of the St. Louis Exposition and was purchased by Havens and later by Mr. de Young.

The historical background of the picture has to do with Napoleon's disastrous Russian campaign of 1812. The Corsican conqueror made his solemn entry into Moscow on the morning of September 2, 1812, and took up his residence in the Tzar's palace within the Kremlin. Many shops were already on fire and the flames were rapidly spreading. Great bazars were swept by fire within the hours immediately following Napoleon's arrival and several times the blaze turned in the direction of the Kremlin. When the alarm was again and again raised that this great mass of buildings had caught fire Napoleon's officers besought him to leave Moscow. He refused until an outburst of flames in the Kremlin at last compelled him to think of his own safety. He left for the Petrofsky palace in the suburbs and hardly had his forces left the Kremlin when it became a sea of flame.

The picture has caught a moment when Napoleon's officers and advisers are just leaving their commander after another urgent plea to seek safety. In the huge vaulted room Napoleon sits at a table before a deep arched window. The intensity of the scene that has just passed is hinted not only in the somber look of the Emperor and the droop of his pose, but in torn and twisted papers that strew the floor. The officers are leaving through a door at the back of the room, heads bent in sadness.

Two paintings that picture the varying moods of autumn are "Premiers Soirs d'Automne," by Jules Lanet, and "Golden Autumn," by G. M. Shlugleit. The Lanet picture shows a quiet river bend with a tree-lined path along the bank leading to the distantly glimpsed

meadow. On the gray-green surface of the water float a few yellow leaves, the heralds of autumn. "Golden Autumn" also shows the bend of a river, hedged with yellow-leaved trees, laid in with broad brush-strokes.

N. F. Bounin's great painting, "Morning After the Battle," is hung in this gallery. The scene of this picture is a battlefield strewn with the bodies of men and horses and the wreckage of war. In the foreground lies the body of a soldier, and near it stands a horse, mane and tail blown by the wind, head thrust forward in mute appeal for help. In this horse, left behind by the tide of battle, frightened by the loneliness and strange happenings, but faithful to his dead master, the artist has centered the power of his picture.

A canvas of the early Renaissance period is "Bacchus and Ariadne," one of the numerous pictures in which Titian and his nephew, Vecellio, collaborated. Titian painted the original to hang in the palace of Duke Alphonso d'Este. There it remained from 1523 until a comparatively recent time, when it was purchased and placed in the National Gallery in London. A few years after the original was completed, Titian, assisted by his nephew, made the copy which hangs in the Memorial Museum. Many of Titian's best-known paintings were reproduced in this interesting fashion, the master advising and guiding the hand of the lesser artist.

Between the large gallery in which hang the principal Russian paintings and the plaster gallery is a gallery devoted to a miscellaneous collection of pictures, including others of the Havens collection purchased and donated by M. H. de Young. Among the best of this group are "The Philosopher," by De Jans; "How Beautiful Is Life," a figure study by M. Suchorowski, notable for the texture of the fabrics; "Five O'Clock Tea," by Gordon Coutts; "Street Scene in Algiers," by W. P. Keller; "Vagabond," a small canvas by W. E. Marsowsky; "Sunset," by G. H. McCord; "Holland Mother," by G. L. Sythoff, and "Belgian Women on the Quay Vert," by Jules Benoit Levy.

The De Jans canvas is the study of an old man, clad in a robe of dark richness, reading in the corner of a library. His head, with its heavy gray hair and full beard, is silhouetted against a background of mellow old books in time-enriched tones. The colors are deep and strong, somewhat inclined to somber shades, and the entire composition is dignified and firm.

"How Beautiful Is Life" shows a young woman in a robe of white silk seated in front of a tapestried wall. Both hands are clasped behind her head, and her pose is one of languorous ease. Her slow smile and the almost feline comfort of her lazy pose indicate that the beauty of life for her evidently deals principally with contentment and ease. The texture of her white gown and the contrasting darkness of the tapestry are well handled.

"Five o'Clock Tea," the Gordon Coutts picture, is a large canvas showing a scene of homely friendliness. A little girl is carefully helping a white-haired and fragile old woman from her easy chair by the window to the table in the foreground, where tea is spread—evidently by the hands of the little girl herself. The lighting of the picture is particularly charming in the soft afternoon radiance that streams through the window into the shadowed dusk of the room.

"Street Scene in Algiers" is a brisk little picture, showing one of the characteristic Algerian bazaars, crowded with figures and spirited with life and color in the brilliant unshaded tones of the East.

"Vagabond," one of the smallest canvases in the room, is one of the most interesting for the fine recklessness of the pose of the single

figure it shows. Beside the water's edge—indicated without too much detail—stands the vagabond, a man in ragged garments with his red blouse tattered and torn from his shoulders. The right arm is swung out and the body follows its swing with an evident indication that the vagabond is cheerfully uncertain of his footing. The artist has caught the pose that splendidly characterizes a reckless abandon.

"Sunset," by G. H. McCord, is a study of Italian fishing boats with the light of sunset on their brilliantly colored sails. The luminosity of the atmosphere and the vividness of the light are the strong features.

"Holland Mother" is in strong contrast, with its soft greens and browns of the Dutch interior, where the mother and children form a quiet family group. Peaceful harmony of tone is the prevailing note.

"Belgian Women on the Quay Vert" is a notable example of the use of broad masses of color. It pictures three old women, clad in long black cloaks and hoods, gossiping on the quay with a background of old houses. The colors are handled in sweeping masses and simple design, with the red roofs of the houses and touches of red in the quay stones relieving the somber tones of the cloaks and the quay walls.

"Venetian Water Fete," by Antonio Rotta, is a decorative composition, picturing two gondolas filled with brilliantly costumed merrymakers. It is characterized by a hard brilliancy of drawing and color and an almost complete absence of background except for a mere indication of the waters of a canal.

"Return of the Gleaners," by Georges Langee, is a Breton scene, showing women carrying sheaves, returning through a half-reaped field. The coloring is soft and delicate.

"Russian Peasant," by A. Asti, is a good head study, portraying a heavily bearded peasant type.

A graceful little animal group is Brunet-Neuville's "Cats," a playful study of kittens.

Other pictures in this gallery include "Stag Pursued by Hunting Dogs," by Adolphe Thomasse; "Landscape," W. A. Coffin; "Evening Rays," I. I. Zemboulat-Popoff; "Little Scissors Grinder," Emile Adan; "Diana and Actaeon," M. Jury; "Grecian Maiden," G. Seignac; "Chanticleer," F. Andikeller; "Piquant," G. Belli; "Girl and Hollyhocks," Amedee Brouillet; "Winter," Arthur Hoeber; "Old Cliff House," J. A. Partington; "Logging in California" and "Indians in Snow," William Hahn; "Flowers," G. Jeannoir; "Chrysanthemum Girl," M. Sandona; "Music," A. Zampigli; "Goats," Van Sluys, and "The Girl and the Sheep," Julius Schrader.

The famous "Samson and Delilah," by Paul Emile Jacobs, is the principal feature of another art gallery in the 1917 unit of the museum. This large canvas, hung directly opposite a doorway where an excellent view is obtainable, presents Samson at the moment of his capture by the soldiers, Delilah, her task accomplished, watching in triumph. It is a magnificent composition, done in powerful lines and masses, the harsh angularity of the group of Samson and the soldiers contrasting sharply with the rounded softness of Delilah, who shrinks into a corner of the couch out of the way of the struggling men. Samson, held in the grip of the soldiers, flings his whole strength into a desperate effort for freedom; the furious strain of the muscles and the wrench of his body are easily grasped. In coloring, the picture follows the Italian school, particularly in the dusky flesh tones.

"Samson and Delilah" went through many vicissitudes before it was hung on the museum walls. It was painted in 1845 and brought to San Francisco in the 50s by J. C. Duncan. Shortly after that time

it was sold at auction with other pictures, and brought $30,000. The picture was hung in the Bank Exchange, a famous old hotel where gold dust was weighed out over the bar in lieu of coin. Hard times finally came upon the Bank Exchange and the picture was sold for $20,000 and placed in Hacquette's, another famous resort of the early days. In 1906 the picture was saved from the fire and not long afterward was bought by Mr. de Young to be placed in the museum.

This gallery contains several pictures of especial interest and value, both modern paintings and of the older school. "Susanna" is a typical seventeenth century Italian painting, dating to 1670. "Flowers," by Constantin, is of the period of Napoleon III.

Among the larger canvases is "Temptation," by Upetnepr, a Russian artist. It is an allegorical scene, portraying a woman in black garb standing between groups of symbolical figures, one group of spiritual types and the other of worldly figures, evidently inviting to a life of pleasure.

"Ivan the Terrible and the Hermit" is by P. T. Heller, whose work is represented in other galleries. It is a historical painting, representing the dread Ivan the Terrible, the ruthless Emperor of the Russians, whose cruelty manifested itself in many ways. According to the story, the hermit foretold Ivan's murder of his own son, whereupon the tyrant promptly threw the prophet into prison. There Ivan visited him, and the undaunted hermit prophesied Ivan's own end. The picture brings out a strong contrast between the splendor of the imperial robes of Ivan and the rags of the hermit.

"Honeymoon in Venice," by L. de Joncieres, is a canvas slightly on the poster order, showing a man and woman in costume that very definitely fix the year of the painting, floating through the Venetian canals in the inevitable gondola.

"The Confession," by Edmund Blume, is a dramatic conception portraying the deathbed of a man whose crimes are evidently so terrible that the monk who listens to his confession shrinks back in horror. The tortured face of the dying man and the fright in the monk's attitude are well rendered.

"Hesiod and the Muse" is a classical study by E. Foubert.

"Two Friends," by A. I. Alexyeff, is one of the most charming canvases in the gallery. It pictures two girls in Italian costumes standing on a balcony with a vista of city roofs behind them. Their heads are close together over a letter. In grace of composition, airy lightness of handling and delicacy of color, the picture is delightful.

E. C. von Liphart is represented by two panels portraying "The Education of Cupid."

Jules Pages, a San Francisco artist, contributes one of his excellent figure studies in "An Italian Peasant." The peasant in his ragged garb of everyday stands easily posed before an arbor covered with vines, and the picture is suffused with the rich luminosity that is characteristic of Pages' work. The subject of the painting was discovered by the artist asleep in a field near the Villa Medici, Italy, waiting for a farmer to need his services. Pages immediately saw his possibilities as a model, made the sketch and told the man to return the next day for more work. Unfortunately, when the peasant appeared, his picturesque everyday costume was changed for a stiff and unbeautiful "Sunday best," and, worst of all, he had undergone a shave and haircut. Fortunately the sketch had been made before the man's picturesqueness was completely destroyed.

"Boyarin Marazoff," by T. T. Bucholtz, is a Russian painting of semi-historical nature. The Boyarin Marazoff, or Lady Marazoff, was

Grand Duchess of Moscow, and the scene represents the presentation of a nobleman coming to visit her court. The splendor of the court robes and the luxurious surroundings make the picture a colorful composition.

"Russian Horse Fair," by Josef Chelmonsky, is a spirited country scene with horses driven at full gallop down a path lined with spectators. The composition is unique in its horizontal lines and sharp opening of perspective.

"Venus and Cupid," by Giovani Barfieri; a Gordon Coutts landscape, "Deep Water," an idyllic study by I. A. Djenyeef, and "Old Heidelberg," by Lacroix, are also in this gallery.

One entire art gallery in the 1917 unit is devoted to a display of paintings by French modernists, originally sent to the United States for exposition display and purchased by Mr. de Young for the museum.

Most conspicuous in the gallery is "Passing Illusion," by Georges Laverne. This large canvas is almost entirely in varying tones of blue, creating an effect of lightness and unsubstantial loveliness demanded by the theme. An Arcadian shepherd leans against a tree, idly gazing at the wraiths of fair women that pass in a dim cloud before him. His look is detached and dreamy, as if the vision were a mere momentary creation of his imaginings.

Several interesting pictures find room in this gallery, among them Cyprien Boulet's splendid canvas, "The Heroes." This modern painting shows a glimpse of an ambulance hospital near Verdun in 1915, close to the battle front, with the surgeons working feverishly over the wounded men. It pictures the interior of a hut, lighted by the flare of an oil lamp that hangs over the surgeon's table. On a stool under the lamp sits a wounded man in the torn uniform of a poilu, the surgeon working over a wound in his head. Other wounded men are grouped in the background, while a priest kneels by a dying man.

Strongly realistic in theme and treatment, the picture is a very powerful conception and a sincere tribute to the heroic poilus of France. The wounded man who occupies the foreground is not the soldier of fiction, but is very evidently a man of the people, perhaps a little shopkeeper or a small farmer, dignified by his uniform and his service. Grim though the theme is, the gruesome side of the scene is not unduly dwelt upon, but rather suggested by masterly touches.

A battle picture of very different type is Ferdinand Gueldry's "Battle in Laces." This is a reminiscence of the days of Louis XV, when cavaliers of the court battled for the entertainment of La Pompadour, donning their most brilliant silks and satins for the occasion. The scene pictured is at the close of the battle—a real battle to the death and not a sham fight—when the survivors are riding over the bodies of their comrades to salute La Pompadour, who, in all her luxurious finery, stands on a grassy hillock to watch the affray. It is a brilliant study of vivid colors and fine composition.

"Sancho Panza" by Abel Boye is one of the best canvases in the room. The famous Sancho is shown in a half-length view, riding comfortably on his donkey, and smiling with vast contentment directly out of the picture. It is a splendid portrait study, full of the irresistible humor of the real Sancho, and in line and color, easily and strongly handled.

Ferdinand Levy-Alkan is represented by "The Family Reading Lesson," a pleasantly conceived group of quiet interest.

Georges Roussel has two canvases, "Ballet Girl" and "American Dancing Girl," characteristic studies in broad coloring.

"Dreaming in the Park" is a graceful pastel by Francois Thevenot.

Mme. E. Darbour contributes "Return From the First Ball," a pretty conception of a charming young debutante in her white ball gown, seated before her mirror and dreaming of the joys of her first party.

"French Pilgrim," by Angelo Delasalle, is an interesting head study of strong lines and color.

Other canvases in the gallery are "Rest of Country Peasant," a pastoral sketch by Widoff; "French Wagon in the Forest," a quietly restful woodland scene by Jaques Roger Simon; "After-Dinner Punch," a genre picture by Leonie Michaud; "Innocents' Paradise," a curious and rather stiffly handled composition by Mlle. Taupenot; "Boy Sailors," Paul Jobert; "Runaway Cattle," Georges Caperas; "Little Fisherman," Charles Riviere.

In one of the spacious art galleries of the 1920 unit are gathered the most notable of the smaller canvases in the museum collection. Here are the D'Aubigny, the "Saint at Prayer," credited to Da Vinci; the two Blakelocks, the Peale portrait of Washington; two beautiful little Veltens, a Benjamin West portrait, Jiminez Aranda's "Holy Week at Seville" and a large number of excellent paintings by American and European artists of various periods.

The D'Aubigny landscape is quite typical of the work of this youngest of the famous Barbizon group. It is suffused with his favorite dusky tones, with a glimpse of the moon between the trees lighting the center of the picture and a dark pool in the shadows. The restrained and powerful handling of the masses of shadow and light are characteristic of D'Aubigny, who frequently atoned for the lack of distinct outline and accurate drawing by atmospheric strength and beauty of chiaroscuro.

The "Saint at Prayer" is a very lovely head study of a spiritually beautiful woman in the robes and halo of a saint. The delicacy of the treatment, the grace of the pose and the rapt beauty of the expression are Da Vinci characteristics. The colors are dimmed, but still retain a suggestion of their original brilliancy, and the delicate handling is evident. The saint is posed under a gracefully modeled arch, and a wreath of roses encircles her head. Her hands are clasped in prayer and her eyes are raised.

Ralph Albert Blakelock, brought so conspicuously before the public eye not long ago, when his friends finally obtained his release from the asylum where for a long time he had been held as insane, his mind weakened by his desperate struggle for artistic recognition, is represented by two characteristic canvases. Both are landscapes in dark, rich tones, done with determined and bold brushwork and a strongly effective blending of the dusky shades. The smaller of the two pictures shows a half-glimpsed clump of trees looming in indefinite yet suggestive outline through the dusk of the fields. The larger presents another night scene with the moon breaking through the torn clouds and a tree silhouetted against its glow.

The Peale portrait of Washington was painted by the artist, Rembrandt Peale, as a copy of the original done by him in 1795, four years before the death of Washington. The original portrait must have been one of Peale's earliest, for the artist was but 20 years of age when he painted it. A considerable time later he made the copy now in the museum. It shows the head and shoulders of Washington, and is particularly interesting in picturing him in the years after his retirement from public life, when advancing years began to show their traces. Washington was 63 years old when the portrait was painted. Peale painted a number of portraits of Washington.

"Rendezvous de Chasse" and "The Chase," by W. Velten, are two small oils, extremely delicate and daintily firm in their treatment. In subject they are not unlike the old English hunting prints, but the medium is handled with the delicacy of a miniature.

"Portrait of a Lady," by Benjamin West (1738-1820), is a characteristic product of the period with the somewhat affected pose, the tinge of artificiality, the First Empire costume and the consciously smiling expression of the "lady." West, an American, is chiefly noted for his historical paintings.

Jiminez Aranda, a Spanish artist of note, is represented by one of the most interesting pictures of the collection, "Holy Week at Seville." The scene is in the cathedral square. Standing in the stone pulpit at the cathedral door, a friar addresses the crowd gathered about him. Study of the picture is lavishly repaid by the wealth of character interest in the throng and the minute care with which every detail is carried out. Each face in the crowd is an individual study; the earnest standard-bearer directly below the pulpit, the senorita who casts a flirtatious glance at a handsome cavalier near by, the two courtiers who are more interested in the pretty girls than in the friar's words, the stolid peasants, old men and women, children and many others. The necessary elaboration of detail in the matter of costumes and accessories in such a crowded canvas is handled with full development of individual effect and yet without undue emphasis on minor points.

Many other pictures in this gallery are of unusual interest. "The Widow," by A. Birelli, is an interesting portraiture of an Italian peasant woman seated despondently on the stone step of the hearth. The somber tones of brown and black, unrelieved by anything further than the lighter flesh tones, gives the atmosphere for the expression of hopeless grief and utter dejection in the figure and face of the woman.

C. D. Robinson, well known for landscape work, and particularly marines, has four canvases in this gallery, "Grand Canyon," "Cypress Point, Monterey," "Lake Louise" and "Golden Gate."

"Chanting the Litany," by C. Sandrucci, is a masterly portrait study of a genial monk in the full swing of the chant. One may easily imagine the vigorous tones that are proceeding from the comfortably rotund brother, whose utter absorption in the business at hand is indicated by his look and by the expressive finger with which he is keeping time.

"Holland Fish Market," by Gerard (1770-1836), is credited with an interesting history. Gerard was a painter much in favor at the court of Napoleon and painted the famous "Battle of Austerlitz" for the Emperor. The picture in the museum is said to have been painted at the order of Joseph Bonaparte, brother of Napoleon, and sent to the United States in 1817, after the downfall of the Bonapartes, with other pictures owned by Joseph. In 1839 the collection was sold and this picture placed in a Boston exhibit, arranged for the benefit of charities. In 1863 it was sold to Samuel Brannan, who brought it to San Francisco, and later passed into the ownership of Alexander Badlam, whose daughter gave it to the museum.

The picture is a scene in a corner of a busy fish market, with rather realistic fish offered for sale by picturesquely costumed Dutch maidens.

A delightful genre picture is "Markgruf Peasant Woman," by E. Schwabe. This quaint little old woman of the picture is seated at a table enjoying a frugal tea. Teacup in hand, she leans forward to

smile from the canvas, every line of her wrinkled face and her black-clad figure with its white cap expressing kindliness and good humor.

V. Cavalieri's "Whirlwind in a Nunnery" is an unusual conception, effectively handled. The scene is in the quiet courtyard of a nunnery, rudely disturbed by an unceremonious little whirlwind that is scattering the fallen leaves and sending the white-robed novices scurrying for shelter, their robes blown in flapping folds.

A spirited composition is F. Raubaud's "Scene in Russia," showing a typical Russian troika, with its three horses abreast, coming at full speed down a narrow road between the houses of a village. The picture is full of animation and energy.

A number of small marines and fishing village scenes are included in this collection. Notable among them is Emil Vernier's "Windy Day on the North Sea," a small canvas filled with the suggestion of fresh sea winds and dashing spray. "Breaking Waves," by N. Hagerup; "North Sea Fisherman," by Laurtis Sorensen; "Gambling Boys on the Beach at Naples," by Bernard Hay, and "Fiord in Norway," by Anker Skaga, are all in this class.

"La Prise du Drapeau" ("The Capture of the Flag"), by Desvarreux, is a battle scene, showing a cuirassier breaking through the enemy ranks to snatch the flag and gallop away with it. Another battle picture of different type is "Last of the Battalion," by Jules Monges, portraying a wounded Zouave who drags himself feebly to a wall to write, with finger dipped in his own blood, the battle cry of his regiment.

A large picture by N. A. Schabunn, a Russian artist, is "After Reaping," showing a Russian peasant woman, her arms filled with golden sheaves coming through the grain field.

Several pictures in this room deal with court life of the last century or so, a favorite topic with artists who enjoy the rendering of satiny fabrics. Among these are "Neckerei" ("Teasing"), by H. Buchner; "Court Tailor," by Thompson, and "Falconer's Recital," by Vacslav Brozik, the last a picture full of brilliant color and humorous interest.

Among the landscapes are Gordon Coutts' "Marin County"; "Dream of Nemi," by Charles Walter Stetson; one by Courbet, a small canvas by Broker and others.

The gallery contains several tiny canvases that are veritable little gems of art, particularly in the field of character portraiture. "Chess Players" is one of the best of these, and others worth while include head studies by Grutzner, Piazetta, Emma von Mueller, H. Schmienen and others.

A. Montemezzo is represented by "Caravan," a canvas of a type not unlike the two Veltens—a delicately painted English country scene.

A miscellaneous collection of portraits, small landscapes, figure studies and other paintings completes the gallery.

The remarkable painting by L. Beroud, "Rubens Room at the Louvre," is the central feature of one of the art galleries in the 1920 unit. Hung at the end of the room, the picture is shown to the best advantage, its strongly luminous atmosphere receiving full value.

The artist has represented an end of the famous Rubens room of the Louvre in Paris, where the precious treasures of the old master are hung. Coming down the broad steps are visitors of varying types, just such a group as might stroll into the gallery. A woman artist is seated at an easel, copying one of the paintings, with a priest talking to her. The difficult task of copying the Rubens paintings on the wall is met

by suggesting them in indistinct outline, the angle at which they are viewed lending its aid.

Hung on either side of the Beroud picture are two pleasing Western landscapes by T. Hill. One represents a lake, hedged with trees and with cliffs in the distance, toward which two horsemen are riding. The picture is touched with a warm sunset glow. The other shows a bit of the plains with a snow-capped mountain in the distance. A group of Indians in the foreground have kindled fires, and the light smoke is rising in delicate lines.

C. D. Robinson is represented by two large marines, one a night scene in tones of intense blue, and the other "The Battle of Mobile Bay."

The Venetian school of the late sixteenth century is represented by Francesco Bassano's "Venetian Interior." Bassano lived from 1550 to 1591. The picture is dim with age, the background almost lost in shadows. Strong lights are cast on the quaintly costumed figures of period type.

Three excellent examples of the work of Charles Rollo Peters are hung in this gallery, "Mission San Juan Bautista," "Elkhorn, Twilight Glow," and "Casa Castro." "Mission San Juan Bautista" and "Caso Castro" are typical Peters night scenes, painted in intense deep blues and shadowy tones with the subtle touch of vivid light that brings the darker colors into high relief. "Elkhorn, Twilight Glow" is a very lovely study of marshland and water suffused with the crimson light of sunset.

The gallery also holds four characteristic H. J. Breuers mountain scenes with the vivid blue shadows and glittering white snow peaks that are associated with this artist's name.

A William Keith hung in this gallery is a beautiful pastoral scene, showing the slope of a hillside with dark shadowy trees and drifting clouds, all in rich blue-green tones.

Anna Klumpke, the protege of Rosa Bonheur, is represented by a portrait study of her father, a strong and easy presentation of the old man with full white beard and hair. The pose is splendidly simple and powerful.

A quaint picture, notable more for historic interest than artistic value, is Oscar Kunath's "The Luck of Roaring Camp." It illustrates the Bret Harte story, picturing the moment when the miners of Roaring Camp made their contributions toward the support of the baby "luck," who lies on the table in the midst of the group.

Clarkson Dye has two good canvases in this gallery, "Street in Havana" and "Golden Sunset," a study of strongly luminous clouds.

An interesting picture in which the artist has managed to meet what was evidently an order to depict a type of grape characteristic of California, and yet has created a painting of artistic interest, is Edwin Deakin's "Flaming Tokay." The grapes, true to nature and excellently painted, hang in a Gothic arch of stone in a very interesting and effective composition.

Among other canvases in this gallery are "Scene at Concarneau, Brittany," C. P. Grayson; a Teniers portrait; Gordon Coutts' "Ghost Story," an oddly decorative composition of a white-haired story teller and his juvenile audience in a woodland setting; a print from a Lenbach sketch of a child's head; a small Van Sluys; "In the Meadow," Julien Jos; "Cabbage Patch," John A. Stanton; "The Coquette," W. J. Reynolds; "Portrait of a Lady," Harriet Blackstone; "Landscape," Jules Tavernier, and other smaller paintings.

"King Saul." Executed by W. W. Storey, one of the greatest of the world's sculptors, from a single massive block of Carrara marble. Statuary Hall.

The Corridor Exhibits

Some of the Museum's Best Canvases—"The Town Crier" and "Sur le Zinc"—Pictures by Keith and other California Artists.

Joseph Raphael's interesting and powerful painting, "The Town Crier," is one of the principal pictures of the collection hung in the corridor that leads from the entrance door to the 1920 unit. This particular collection, incidentally, contains some of the museum's best canvases. In addition to the "The Town Crier" there may be found Jules Pages' delightful genre picture, "Sur le Zinc"; three Keiths; two Breuers; Harrison's lovely little "Dreamer" and "Breton Fisher Boy"; a Charles Rollo Peters night scene; a landscape and an effectively decorative "Wine Maker," by Arthur Mathews; a Lucia Mathews landscape; two canvases by Frank Van Sloun; Charles Grant's "Atlantic Fleet Entering Golden Gate, May, 1908; a Cadenasso landscape; Edwin Deakin's "Doorway, Castle Cluny, Paris"; "Girl at Piano," by Caroline Rixford Jahn, a charming portrait study; "Girl Reading," by Mary Curtis Richardson; "Salmon Trout and Smelt," by Brooks.

The beauty of "The Town Crier" is the splendid handling of the principal figure, the man in Dutch costume who stands in the midst of a group of children, also in picturesque dress. He stands with his left foot advanced and his body in easy repose, yet suggesting muscular strength and control. In his right hand he holds the huge wooden watchman's rattle, the badge of his profession. The expression of the face is serious and dignified, but with a hint of humor and kindliness. The children who surround him are carefully subordinated to the principal figure, keeping their individuality, but so composed into the group and painted in such restrained tones that the focal point of the canvas is the figure of the man in its dull blues and browns. "The Town Crier" is one of the best examples of figure handling in the museum's galleries.

"Sur le Zinc," by Jules Pages, is also interesting for its figure work and the character study that is evident in its make-up. It is a glimpse of a rather dingy little French cafe, evidently on the water front, judging from the three patrons who lounge in front of the bar. Behind the bar stands a buxom woman, muscular arms leaning on the bar, on her face a smile of hearty good-fellowship and the easy carelessness of her dress and hair excellently placing her type. Prominently in the foreground stands a young man, perhaps a fisherman or workman, in rough garb, hands thrust in the pockets of his trousers and his shoulders slouched forward. Two men stand in the background, and behind the barmaid are long shelves filled with bottles and glasses. The composition is handled in long sweeping lines of steady interest, particularly in the figure of the man in the fore-

ground. The color is clear and firm, and the entire picture is filled with homely warmth.

The three Keiths, all landscapes, are excellent examples of this painter's work. The largest, "Sunset," is a typical Keith product in rich dark tones, the clumps of trees and the outline of the landscape indistinctly suggested except at the center of the picture, where the sun breaks through the clouds with a strongly luminous radiance, an intense although rather somber glow that touches the edges of the clouds with copper brilliance and lights up the tops of the trees.

Above this picture hangs another Keith, a charming landscape in rich coppery tones, soft golden browns and darker shadows. It represents a flock of sheep passing through a meadow, and the warm browns of the composition are beautifully handled.

The smallest of the three Keiths, which has been valued at $3000, is a glimpse of a dark pool edged with dim clumps of trees. Cattle stand at the margin of the water, and the soft obscurity of dusk falls over the scene.

The two Breuers are typical mountain paintings in the intense blue and glittering white that inevitably characterize the work of this artist. These particular mountains are Mount Assiniboine and Mount Sir Donald, snow-capped peaks.

"Dreamer," by A. Harrison, is a beautiful little canvas showing a nude boy lying on the sands at the edge of the sea, his back to the artist, his head propped up on one hand, and his whole pose filled with the suggestion of languid, drowsy dreaming. The color tones of the picture are beautifully soft and mellow, and the flesh tints are delicately lovely. The edge of the water, with the tiny ripples slipping over the sands, is charmingly handled.

"Breton Fisher Boy" is another Harrison of much interest. A typical lad of the water front stands, hands in pockets, gazing up at a poster affixed to a wall. The drawing of the figure is full of personality and humor, and the coloring is delightful.

The Peters canvas is a characteristic night scene in the deep blue shadows that are instantly recognizable as Peters' work, with the usual point of golden light to focus the composition.

Arthur Mathews' landscape is a painting in flat washes of mellow and subdued tones, decorative in composition. "The Wine Maker" is also highly decorative in scheme, suggestive of a design for mural use. The wine maker, wearing a simple classic drapery of dull red, contrasting effectively with the brown tone of the flesh, kneels over a wine jar, squeezing the grapes. It is also done in flat washes and broad masses of color.

Lucia Mathews' landscape is similar in treatment to the Arthur Mathews canvas, showing perhaps a slightly more general handling.

Frank Van Sloun is represented by an excellent portrait of Sir Henry Heyman and "The Mirror," a study in unfinished handling of a woman seated before her dressing table.

"Atlantic Fleet Entering Golden Gate," by Charles Grant, is a historical painting, showing the white battle-ships of the day sailing into a bay of intense and clear blue. The coloring is clear and brilliant.

The Cadenasso landscape is somewhat impressionistic in tone, showing a flat marsh country with tall, straight trees reflected vividly in the pools of quiet water. The reflections are interestingly handled.

The Deakin "Doorway, Castle Cluny, Paris," is a graceful little sketch of a pleasing bit of architectural detail.

Caroline Rixford Jahn contributes a good portrait study of a young girl seated at a piano, a charmingly youthful pose.

"Girl Reading," by Mary Curtis Richardson, is also a portrait study of a young girl, seen in profile with head bent over her book. It is very graceful and pleasing.

"Salmon Trout and Smelt," by Brooks, is a realistic presentation of the glistening fish, displayed in the market.

On the opposite wall of this corridor hang about 125 water colors of California wild flowers, interesting both for their artistic effect and their botanical value.

The corridor displays are completed by the collection of large photographs of Midwinter Fair scenes that hang on the wall opposite the Skae collection of paintings. All the buildings and picturesque corners of the exposition that was the beginning of the Memorial Museum are represented.

Eight small bronzes stand on pedestals in the two entrance corridors. They include reproductions of antiques and such pieces as Cordonnier's "Herault d'Armes."

The principal feature of the gallery devoted to water colors is the collection of wild flower paintings by Mrs. Ellis Rowan of Melbourne, Australia, who is said to be the most famous living woman water-color painter of flowers and birds. Her work has won ten gold medals, fifteen silver and four bronze awards at expositions.

This remarkable collection of paintings of Australian flowers and birds was purchased and donated by Mr. de Young. The pictures combine fidelity to nature and botanical or ornithological exactness with artistic value, and are executed in minute and careful detail.

The general collection of water colors is of varied interest and value. Among them are some good figure studies by Merz, including a priest wearing a dull yellow robe that is interestingly handled, and an easily posed figure of a fisherman. A. Farnsworth's little sketch of "Chinatown" is pleasing, and a girl's head by Gamba is good.

Farnsworth also contributes effective little sketches of "Fisherman's Wharf" and "Bolinas Bay," and two Japanese studies, "Marine Sunset in Japan" and "Scene Near Kamakura," by Hans von Hohenrest, are good in coloring. An old-style landscape is by Frederick Nash, 1782-1856. Raoul Longpre fils contributes a sketch of lilacs. Perez' "Chorister" is a good figure study.

Among other pictures in the gallery are "Walter Scott's Tomb," P. Fletcher Watson; "Yosemite Valley," Chris Jorgenson; "Man With Guitar," A. Petrocelli; "Interior," H. J. Odissio; "Mountain Path," C. H. Chapin "Coast Scene," P. Paysons; "Whitewasher at Lunch," Kappec; "Lady," O. Ludovici; "The Reaper," D. E. Angelis; "Lovers," J. E. Clerc; "Indian Chief With Squaw and Papoose," E. B. King; "Sedan Chair," Vardi; "Girl," R. Senit; "Military Sketch," M. L. Potter d'apres Meissonier; "African Bird Seller," Ramirez; "Alhambra," Stanier; "Chrysanthemums," Mme. Coolo; "Blue Market Race," Cecil Alden; "Assassination," Charles Chatternole; "Cattle," L. Coudello; "Fishing Scene," Mary Frutura; "Churchyard," P. Paysons, and others.

Work of California Artists

Alice Skae Collection Contains Good Examples—Oils and Etchings Are Shown.

A legacy of $10,000 left by Alice Skae for the purchase of the work of California artists made possible the collection that hangs in one of the corridor galleries leading to the 1920 unit. Twenty-nine canvases and eight etchings were bought with the fund, all representative of Western work.

The majority of the pictures are landscapes, most of these showing California scenes.

Charles Rollo Peters is represented by "Round Lane, Dorset," one of his characteristic night studies in deeply luminous tones of blue with dusky shadows and the inevitable point of sharply brilliant yellow light that gives vividness to the picture.

"Angora Peaks" is a water color by L. P. Latimer, an effective mountain study.

Theodore Wores contributes "Street in Ikao, Japan," a colorful glimpse of the Orient.

"October Day, Sonoma County," by Will Sparks, is a beautiful combination of rich autumn tones, strongly handled.

Another autumn scene, with tall trees standing near a pool, their leaves aflame with coming winter, is by G. Cadenazzo. The coloring is especially vivid and rich.

"Sunlight and Shadow," by Aaron Altman, is a quietly restful glimpse of the deep woods, with the sunlight sifting through the trees in contrast to the deeper shades of the forest.

"Belle View, France," by Rinaldo Cuneo, shows an odd style of brush work, an impressionistic use of the medium that gives an unusual but effective finish.

Xavier Martinez has "The Road" an easily handled study in broad, smooth coloring and masses.

"Mountain Village," by Henry Poor, is a characteristic landscape bit.

Gottardo Piazzoni's "Silence" is an effective use of suggestion, with its dark pool, dusky trees that line the bank and the two figures that glimmer indistinctly through the shadows.

"Summer Meadow," by E. Charlton Fortune, is a study in summer lavishness of green grass and tree.

Another painting that is full of the hint of spring breezes and the outdoors is "Turkey Farm," by John A. Stanton. The brilliancy of the coloring and the airy lightness of the composition are good.

A water color by Percy Gray depicts "California Oaks and Wild Flowers."

Amedee Joullin has an unusually effective landscape in tones of brown and dull greens. The brilliancy of summer is lacking, but the sandy banks of the little pool, the gray-green of the foliage and the softness of the atmosphere are beautifully handled.

Carl Oscar Borg's "Golden Hour" is a lovely sunset scene, showing a high mountain meadow with the sunset light resting on the tops of the tall trees.

Painting the unsubstantial is accomplished by Maurice del Mue in "West Wind," for the low horizon line of blue hills and lake, with the white clouds heaped high into the blue sky, is full of the suggestion of windy days.

"The Village" by Bruce Nelson, is a study in blue tones.

C. D. Robinson's "Storm on the Bay" is one of his characteristic marines of particularly good effect. The angry light that gleams on the broken water and the ships is full of menace.

"Golden Gate," by Clarence Hinkle"; "Blue Bay, Monterey" by Burgdorff; "Docking," by Richard Partington; "Gold Before Twilight," by Ferdinand Clark Hobart; "Facing the Harbor," by C. Chapel Judson, and "Loch on a Winter Morning," by Lee Randolph, are small sea coast and lake paintings.

"Navajo Gateway," by Francis McComas, is a glimpse of the vividly colored Arizona mountains.

A splendidly atmospheric painting is "Corral Dust," by Maynard Dixon, a vigorous sketch of cowboys and cattle full of the suggestion of heat and smothering dust.

Gertrude Partington contributes "The Actress" a portrait study with impressionistic values.

Betty de Jong's "Pancake Vender" is painted with the use of flat tones and angular masses that was typical of Miss de Jong's work.

"Expulsion of Adam and Eve," by Frank Van Sloun, is decorative in character and in the broad lines of its composition and color might well have been designed for mural use.

"Impression," by Armin Hansen, is a still life.

Joseph Raphael's "Spring Winds" is an impressionistic presentation of the theme—a garden indicated by rows of color patches trees lightly sketched and the figure of a woman in a cloak broadly indicated.

Theodore Wores is also represented by a beautiful presentation of the Santa Clara valley in the soft splendor of spring-time blossoms, a delicate drift of pink and white.

The etchings are "Monterey Dunes," by Robert Harshe; "Before the Wind," Armin Hansen; "Hillside Houses," Gertrude Partington; "Fishing Day," a tinted etching by Pedro J. Lemos; "Champs Elysees, Paris," Gottardo Piazzoni; "Chinatown," J. W. Walker; "Windswept Pines, Monterey," Lee Randolph, and "The Cirque," Worth Ryder.

At the end of the gallery is a most interesting collection of five large and twenty-three small sketches in oil by Julian Rix. All are landscapes, beautiful little studies with firm, sure color and easy handling. These are not part of the Skae collection.

Gallery of Engraving and Etchings

Historical Engravings of Great Interest—Reproductions of Well-Known Paintings—Wood Engravings—Line and Other Styles—A Whistler Specimen—Etchings of California Artists.

Scores of valuable engravings of all countries and periods are brought together in the gallery devoted to this type of art. Among the items of special interest is the detail drawing of Trajan's Column, the only other copy of which known is in the Vatican; some excellent old English color prints, including some of the rare series, "Cries of London"; a collection of engravings dealing with the life and history of Mary Queen of Scots and a very complete and valuable display of Napoleonic engravings and cartoons.

The Trajan's Column engraving is a sketch in minute detail of the famous monument under which were buried the ashes of Trajan. The column, 97 feet and 9 inches high, is carved with some 2500 figures in relief, showing the victories of Trajan. The pedestal is adorned with reliefs of trophies of Dacian arms, winged victories and other motifs. In the engraving each figure on the side of the column pictured is shown in detail and an explanation accompanies the drawing. The engraving is an Italian production.

The de Young Napoleonic collection is exceedingly interesting and valuable. There are many engravings depicting momentous scenes in the life of the Little Corporal, and in addition a priceless set of colored cartoons of English and French origin in which Napoleon is held up to ridicule.

In the collection of American historical engravings are many of great interest. Contemporary engravings picture scenes of national importance, battle scenes of the Civil War, historic sessions of Congress and similar moments in the Nation's life.

Among the engravings are many reproductions of well-known paintings, such as the familiar Millais "Huguenot," "Sir Walter Raleigh Parting With His Wife," Boulanger's "Appian Way," "Dernier Soupir du Christ" and "Le Judgment Dernier" by Gue, and a good collection of old portrait engravings, principally French.

Perhaps the most interesting of all the old color prints are those which make up the series, "Cries of London." These quaint old pictures, painted by F. Wheatley, R. A., depict the picturesque vendors who haunted the streets of the London that Hogarth and Dickens knew, crying their wares with historic phrases. The series includes the seller of hot gingerbread, the vendor of "strawberries, scarlet strawberries"; "knives and scissors to grind"; "fresh-gathered peas"; "cherries, round and sound, fivepence a pound"; "turnips and carrots" and "sweet China oranges."

Line engraving, applied to such practical uses as the printing of cards, is a method by which the picture or design is drawn on the metal plate in cut lines, ink forced into the hollow parts of the plate

and the rest wiped clean. When the print is made the paper draws the ink from the crevice, giving the finished work its characteristic raised appearance.

Wood engraving, the earliest form, is practically the same as block printing.

Mezzotint and etching have largely displaced line engraving in recent years, except for specialized purposes. Mezzotint differs from line engraving in that the surface of the plate is roughened to receive the ink and produce the desired chiaroscuro instead of drawing definite lines.

In etching the metal plate is covered with a coat of special preparation, impervious to acid. The design is drawn on this surface with a pointed tool, cutting through to the metal. Acid is applied and penetrates through the lines, eating the design into the metal. Dry point etching is done with a different tool directly on the plate, and is frequently combined with the acid method to complete a picture.

Whistler's etchings are known wherever art is recognized. Meyron led the French school, and the United States has produced many gifted etchers, including such men as Joseph Pennell, Charles Platt, Stephen Parrish and many others.

The museum has an excellent Joseph Pennell etching, a glimpse of an estuary with broken-down wharves, piles and all the tangle of a fishing village along its banks, and white-sailed boats in the distance. Charles Platt is represented by a water front scene in sepia.

A Whistler etching of a bridge over a river bears the artist's famous butterfly signature. It hangs directly under the Randal Borough proof.

An interesting item in the exhibit of etchings is an artist's proof by Randal Borough, a strongly tinted glimpse of a California forest with tall Bohemian Grove trees and the firelight showing between them.

Other etchings are by Roy Partridge, James D. Smillie, Otto Baclier, M. N. Moran, R. Swain Gifford, John Sloan, Robert Harshe, H. Farrer, Mary Cassatt, George T. Plowman, Louis Harlow, Pedro Lemos, F. S. Church, Andre Smith and Edwin Borin.

A dozen modern etchings are also shown in the gallery devoted to the Alice Skae collection of pictures.

Jewels, Jade and Rock Crystal

Ivories, Gold and Silver Objects and Gems—Watches and Snuff Bottles—the Kunz Gem Collection—Rock Crystals —Rare Specimens of Chinese Jade—Silver Ships and Salt Cellars—de Young Collection of Ivories—Spoons and Plaques—Watches of Early Manufacture—Enamels and Mosaics.

Like the treasure cave of Abu Hassan or the gold-freighted hold of a Spanish galleon is the new jewel hall of the museum. The collection which for years was housed in the Royal Bavarian palace rooms has been transferred to the new gallery and largely augmented by gifts from Mr. de Young, until the cases that line the walls and the seven big floor cases are filled with rare and valuable objects.

Two cases are devoted to jade, one to the paler colors and the other to darker shades. Between them stands the case containing the magnificent display of rock crystal, a collection the value of which runs well into the thousands of dollars. One case holds antique silver, one is given over to richly carved ivories, and one holds objects of gold, silver and silver-gilt. In the center of the room a flat case contains the Kunz gems. The cases are so placed that from the adjoining galleries a striking vista of the room is obtained, the glass cases permitting a view of collections beyond. Curator Penez and the members of the museum staff devoted many days to designing the installation and placing each tiny object where it would show to the fullest advantage.

The Kunz gem collection was made by Dr. George Frederick Kunz, probably the greatest authority on precious stones and the author of many books. It represents every type of precious and semi-precious stone, many of them both in the rough and polished state, and brought from all over the world. A mere listing of the gems shows their variety: Cairngorm from New Zealand; nephrite (jade) from Russia and East India; amber from the Baltic coast; rock crystal from Austria; jadeite from Japan, India and New Zealand; obsidian from Mexico; carbuncle from India; chalcedony from Brazil and Russia; turquoise from Mexico and Persia; zircon from Ceylon; peridot from the Levant; tourmaline from Brazil and the famous Mount Mica mines of Maine; andalusite from Brazil; diamonds from Brazil and South Africa; jasper from Asiatic Russia; syenite from Japan; lapis lazuli from Persia; garnets from Siberia, New Mexico, India and Bohemia; sapphires from Cashmere, Ceylon and Burmah, including several beautiful star sapphires; topaz from Brazil, Spain and Russia; beryl from Russia and the United States; amethyst from Brazil, the United States and Russia; sardonyx from Germany; sunstone from Norway; moonstone from India and Ceylon; catseye from Germany and Ceylon; opals from New Mexico, New Zealand, Honduras, Australia and Mexico; onyx

from Germany and East India; aquamarine from Siberia; ruby gravel from India, and many other less familiar gems.

One of the most beautiful and valuable collections in the room is the display of rock crystal. This clear, translucent substance, so prized since ancient days, is a colorless and transparent variety of quartz. It occurs as crystals, lining cavities in quartz veins, and because it is frequently found in glacial districts and because it is always cold to the touch, early beliefs held that it was a form of congealed water or ice. The name crystal comes from the Greek word for ice. It is found widely distributed throughout the world, but the chief deposits are in Brazil, Japan, Madagascar, the Swiss Alps, Italy, Cornwall, Wales, and sections of the United States, including New York, North Carolina and Calaveras county, California, where a very fine quality has been found.

Rock crystal has been prized as a material for ornaments from the time of the Romans to the present day. The ancient Romans used it both for this purpose, and, because of its hardness, as a tool with which to incise their intaglios. Of it they made vases, goblets, and other ornamental objects, lenses with which to kindle the sacred fires on their altars, and balls for various uses. Roman ladies of fashion were accustomed to carry balls of rock crystal on hot days to keep their hands cool, since this substance never loses its chill.

During the fifteenth and sixteenth centuries rock crystal was especially popular, and artists of the cinque-cento period made very wonderful carvings. In later years it was somewhat replaced by glass, but true rock crystal has always been highly valued. Particularly treasured are pieces that are flawless; a ball of rock crystal three inches in diameter without flaw or chip is worth not less than $100.

Rock crystal, being a variety of quartz, is not always colorless, although the tinted varieties are known by other names. Rose quartz is a delicate pink, clear or milky; smoky quartz is a beautiful golden brown, due to the presence of iron. Amethyst is given its purple color by a minute mixture of peroxide, either iron or manganese. According to Pliny, amethyst was highly valued among the Romans as a preventive of intoxication. Chrysophrase, allied to rock crystal through its membership in the quartz family, is a translucent stone of pale bluish or apple green, and is of great value. It is mentioned in Revelation as the tenth foundation stone of the New Jerusalem, and since antique times has been held a stone of good luck. Queen Victoria is said always to have worn a bit of chrysophrase, and Russian legend is that the wearer of chrysophrase will never meet with sudden death. Chrysophrase occurs in California; when it was discovered in Tulare county in 1896 jewelers from Eastern cities and London immediately offered to buy up the entire output. Tiffany declared that the California chrysophrase is as fine as the best Siberian variety. Flawless specimens, ready to mount in rings, are worth from $50 to $100.

The museum collection of rock crystal consists principally of the colorless variety with several pieces of smoky quartz, amethyst shades, green and beautiful old rose to show the color possibilities. The most conspicuous pieces are vases, goblets and ornamental objects, elaborately chased and engraved with intricate designs and mounted in gold, but for intrinsic value these are met by several perfectly plain but flawless pieces, such as a flat dish, some six inches across, on which the only decoration is a tiny engraved lobster; several clear balls, a hollowed and halved egg-shaped object, the halves joined by a silken tassel, and four exceptionally fine Oriental grotesques. These little

figures, in particular, are so absolutely clear and flawless that the ancient beief that rock crystal was congealed water is quite understandable.

The rose-pink variety of crystal is illustrated by several beautiful pieces of carving, notably one large specimen in which the natural form of the deposit is followed. Strings of beads are of varying tones, and there is one unusual string of beads in crackle effect. How the shaded quartz is adapted to carvings is shown in a small Oriental group of two figures in which clear and smoky quartz are combined.

Another collection of great value is the display of jade, which occupies two cases.

From earliest times jade has been set aside as an amulet stone of magical qualities. The Chinese, whose jade carvings are unsurpassed, regarded jade as "the quintessence of heaven and earth."

"Jade in China," writes Dr. Kunz, "symbolized all that was high, noble and pure. Kwan Chung in 700 B. C. wrote that its smoothness symbolized benevolence; its brilliant luster, knowledge; its toughness, justice; its rarity, purity of soul. The smallest crack in jade is visible, symbolizing candor. It can be passed from hand to hand without being soiled or marred, hence it typifies a life governed by the highest moral principles."

Jade, in its general sense, includes the two substances known to mineralogists as nephrite and jadeite, although the term is now usually applied to nephrite and jadeite as regarded as an allied substance. It is found in various parts of the world, principally in the Orient, New Zealand and Siberia. Jade implements found in the curious prehistoric lake dwellings in the Swiss Alps were thought to have been imported until later explorers discovered jade deposits in the Alps and in Silesia.

The great New Zealand quarries are on the west side of the south island, and there the Maori tribes gained the "green stones" that served them as amulets. The New Caledonian jade is principally jadeite.

In China the quarries in the Kuen-Lun mountains of Turkestan furnished the greater part of the jade used by Chinese artists. It is generally of a pale color and beautiful quality.

Siberian jade is darker in color and frequently veined.

Explorations in Alaska and Northern British Columbia revealed the presence of jade implements in ancient native graves and on the sites of ruined villages. The source of the material was unknown for years until discovery was made of the Jade mountains, 150 miles from the mouth of the Kowak river, where there are deposits of nehprite that mineralogists have declared to be exactly similar to the New Zealand quality.

At the time of the Spanish conquest of Mexico, the natives of that country and of Central and South America used green amulets that have been declared to be jadeite. The Indians of Brazil prize jade ornaments very highly as amulets against disease and snake bites. Burmese jadeite is pale or almost white in color.

The most valuable qualities of jade are a very dark green unveined color, and, most of all, the pale, opaque green that has been given the descriptive but unattractive names of "mutton tallow" or "pork fat.'

Jade has, by legend, been given great curative and magical powers. The Orient always held it to be supernatural in its powers, and powdered jade was a medicine in Europe as late as 1726, being supposed to cure heart-burn, asthma and thirst, and effective as a general tonic.

Peoples in all parts of the world have made amulets of jade.

Jade ornaments have been found in the tombs of ancient Assyria, and the Chinese mortuary tablets of jade, thousands of years old, compare in historical value to the clay tablets of Babylonia, bearing inscriptions with the events of the reign of the honored ruler. Point Barrow Eskimos have been found wearing talismans of jade, and the Maori chiefs were never without their "hei-tiki" or quaint little jade grotesques. These objects, several of which are in the museum in the jade collection and in the South Sea exhibit, are grotesque in semi-human form, usually about three inches in length and flat. The limbs are curved, the body only indefinitely indicated, and the huge eyes, placed at an angle in the head, are sometimes adorned with inlay.

The case devoted to mutton tallow and the paler varieties of jade contains some of the museum's best specimens, notably a large covered dish that stands in the center of the case. Several of the vases in the group are notable for their purity of color and the curious greasy luster that distinguished the best jade.

Interesting objects in this case are the "Ju-i," or scepters carried by Oriental officials. These objects are slightly curved wands, usually about a foot and a half long and an inch or two wide. At one end is a large circular piece or head, and other smaller discs are set at the other end and half way down the stem. Officials or priests entitled to carry the scepter held it in both hands when they stood before the Emperor, grasping the stem between the discs. "Ju-i" is translated to mean "May all be," presumably interpreted as "May all be well." This form of scepter or wand was introduced into China and India at the time of the Buddhist propaganda from that country. Pictures of Buddhist priests show them carrying such scepters, and the "Ju-i" under its Sanskrit name was one of the seven precious objects mentioned in the Vedas. It is a curious fact that wands of the same shape were used for very similar purposes in ancient Egypt.

The second case of jade contains objects of a darker quality of nephrite and jadeite, largely Russian and Siberian. Some of these objects are of the valuable clear dark green; others are mottled and streaked. Jade pieces in this case that are inlaid with jewels or precious metals are East Indian; East Indian workmen were the only artists in jade to make use of inlay.

Silver work of the Middle Ages is shown in a case filled with antique tankards, vases and other objects, one or two modern pieces also finding space here. The old German tankards are especially interesting. They are heavy, solid affairs, capacious enough to hold a man-sized draught of liquor, and elaborately ornamented with figures in relief and engraved inscriptions. One of the tankards is marked "Eberhard Ludwig, Herzog zu Wurtemberg (Lord of Wurtemberg), 1663." Another, with a long German inscription, is dated 1676, and a large silver vessel bears the date of 1686.

In the center of the case is a huge silver ship that served some German Prince as a wine vessel, for under the stern is the tap through which the wine was drawn. On the billowing sails of the vessel are inscribed the names of "Johann Christoph Prinz von Boden Durlach" and "Maria Christina Felicitas Grafin von Leinigen, 1711," suggesting that the vessel may have been a wedding gift.

These table ships were interesting objects of the period. Frequently they were made to serve as salt cellars and were placed in the center of the table. An old book of the year 1500, "For to Serve a Lorde," directs the "boteler" or "panter" to "set the saler in the

myddys of the table." Seats of honor were "above the salt," while guests of lesser distinction were seated "below the salt." According to the old books of etiquette, well-mannered persons helped themselves to salt "with a clene Kniffe."

Occasionally the table ship or "nef" was made large enough to hold the goblet, spoon, knife and napkin used by the host, and was given a name, just as a modern millionaire names his private yacht.

Another type of table ship is shown in the collection, a dainty little vessel of filigree silver, intended to serve as an ornament.

A picturesque event of San Francisco's history is recalled by the presence of a silver pitcher, "presented to D. S. Terry by Ladies of San Francisco who admire his Courage, honor his Patriotism and take the highest pride in his heroic resistance to Tyranny." It is dated August 28, 1856.

Most modern of all is a silver model of the Berkeley Campanile, made exactly according to scale.

Next to the case of silver stands the collection of European ivories amassed by Mr. de Young on one of his early collecting tours abroad. In the center of the case is the pride of the exhibit, a tall vase of extraordinary size, carved with bacchantes, cupids, masks, fauns and other dainty figures in the most delicate and perfect detail. A very large elephant must have furnished the tusk from which the vase is carved, as it is not only unusually large in diameter, but straight, indicating that the curved tusk has been cut away to provide a symmetrical piece for the vase.

Another unusual example of ivory carving is a slender pipe, fifty-four inches long, carved with rose wreaths in relief on the slim stem and cupids on the bowl. Still another is the hunting horn, carved from a giant tusk and decorated with intricately designed scenes of St. George and the Dragon, a lively boar hunt, portraits of Francis II and Charles IX, fleur-de-lis and other designs. These hunting horns made from a single tusk were known as "oliphants."

Other ivories in this case, smaller pieces, single figures or small groups, are particularly beautiful.

An interesting plaque of ivory carving and silver repousse is exhibited in the ivory collection. It is a large elliptical affair with alternating bands of ivory and silver outlining it. The ivory is richly carved with bacchantes, cupids and other figures in minute detail, and the silver is elaborately designed.

Centered about a large cabinet of Dresden porcelain and silver-gilt, occupying the position of honor in the final floor case, are objects of precious metal, plaques, vases, tankards, coronation and commemoration cups, salt cellars, bonbonnieres and other articles.

The coronation and commemoration cups were made and distributed in honor of important events. Victoria's diamond jubilee is commemorated by a cup bearing two likenesses of the Queen and the dates 1837-1897; the coronation of Wilhelmina of Holland is the subject of another. A tragic history attaches to the Russian coronation cup, presented to his people by the Czar in 1896. So great was the rush to obtain the precious cups that thousands of persons are said to have been trampled to death. Another cup in the collection honors the defense and relief of Mafeking in 1899-1900.

Several interesting collections of spoons are placed in this room. If "fingers were made before forks," spoons likewise long preceded this late-arriving table utensil. Rude spoons of horn, wood or other materials were used by the ancients, and the mediaeval world knew

them well. The "Babee's Book" of 1476, evidently an old-time manual of etiquette, instructed its youthful readers "ne playe with spoone, trencher ne knife," suggesting the table utensils of the day.

Two particular collections of spoons in the museum are the Swiss canton spoons, a display in which each canton of Switzerland is represented by an especially designed spoon, and the valuable array of Dutch silver spoons of the seventeenth and eighteenth centuries, presented by Mr. de Young. These Dutch spoons have very elaborate handles, portraying Dutch scenes, windmills, canal boats and so on. Many individual spoons and smaller collections are likewise included.

On the south wall of the room are two cases in which are displayed antique silver plaques, silver table bells, miscellaneous spoons, and the de Young snuff bottle collection.

Notable among the shields is the Ivanhoe shield, made by C. B. Birch, A. R. A., and serving as the Jockey Club prize at Newmarket in 1883, when it was won by C. J. Lefevre's Ladislas. The shield is a large affair, bearing in the center scenes from "Ivanhoe," various inscriptions and other decorations, and around the edge portraits of the Ivanhoe characters, in which has been traced a resemblance to members of the British royal family of the period.

Two remarkable silver plaques in this display are seventeenth century French work, made by Pierre Justin of Dieppe, a celebrated ivory carver. One of the plaques illustrates the departure of Bohemund I, son of Robert Guiscard of Normandy, on the first Crusade of 1096, of which he was the leader. The other pictures the landing of Bohemund's army at St. Simon, the port of Antioch, which was captured from the Turks in 1097.

The unusual feature of these plaques, in addition to the minute detail with which they are crowded, is the exceedingly high relief of the figures. It is not merely a case of single figures standing out from the background; entire groups are modeled in relief, so that the foremost figures are in relief on those of the background.

Another antique example is an old Portuguese silver plaque which was originally in the collection of Dom Fernando, grandfather of Manuel of Portugal. It represents Una riding on the lion's back, a lion of marvelous anatomy and friendly expression. An old Welsh plaque with portraits and other decoration and an antique silver sconce are also displayed.

Silver repousse, illustrated in these plaques and other pieces, is a method of work by which the design is first hammered out from the inside of the piece, and the hollows are then filled with a certain kind of cement in which hot pitch is an ingredient. This, cooling, forms a filling that possesses a certain elasticity and permits the workman to go over his design from the outside, completing the work. It was known to the ancients, and takes its modern name from the French repousse, or "pushed out."

The silver table bells, part of the large and varied collection given to the museum from the estate of Mrs. Morton Mitchell, are quaint little affairs, shaped to represent women wearing very full skirts to serve as the bell and with their arms often raised above their heads to form a handle.

The de Young collection of snuff bottles is an unusually interesting one. The specimens are Oriental, the snuff bottle forming an important part of Oriental equipment, and are made of many materials, including jade, amber, agate, jasper, cloisonne, cinnabar lac-

quer, rhodonite, rock crystal, quartz and other substances. In shape they are small, round, flat bottles with rounded stoppers, and average three inches in height. Often they are beautifully decorated with chasing, inlay, carving or engraving.

Notable among the snuff bottles is a large red amber specimen that stands on a separate shelf. The South Kensington Museum in London treasures as one of its most valued exhibits an amber snuff bottle, considerably smaller than the Memorial Museum specimen, which is quite possibly the largest amber snuff bottle in existence.

The collection of watches occupies a wall case next to the snuff bottles, and is excellently illustrative of the watchmaking art of early years.

The manufacture of watches was due principally to the invention in the fifteenth century of the coil spring, which permitted economy of space. The first watches were made in curious shapes, more attention being paid to unique cases than to anything else. One type was known as "Nuremberg eggs," from their oval shape. The first specimens had no crystals, and the single hand was seen through a perforated case.

The earliest practical watchmaking was done by Peter Hele of Nuremberg, a clockmaker who flourished in 1490. Immediately after he demonstrated the possibilities of watches great progress was made, and by the beginning of the sixteenth century watches were a recognized article of manufacture.

All during the next two centuries continued improvements were made. The minute hand was added; the second hand mechanism was invented about 1780. Enamel dials replaced metal in 1650. Jewels were used as pivot bearings in 1700, and soon after that time the first keyless watches were made. Lepine of Paris made the first thin watch in 1776.

Watches were counted among the precious possessions of royalty, and were used as gifts among the nobility. Henry VIII owned a watch that would run a week without rewinding. Mary Queen of Scots had several watches, and in the time of Elizabeth watches were well known. History declares that in 1571 Leicester presented to Elizabeth a jeweled armlet in which a watch was set—perhaps the first recorded wrist watch of the world.

The museum collection of watches is representative of the best French and English work of the seventeenth and eighteenth centuries in enamel, gold, silver and other materials. There are several examples of the heavy perforated metal cases, and some of the curiously shaped watches of an earlier day.

A beautiful collection is the display of snuff boxes of the seventeenth and eighteenth century period. Most of these were donated by Mr. de Young; others came from Miss Sarah Spooner, donor of many valuable articles. The covers of many of the boxes are painted with miniatures on ivory or porcelain; others are carved or jeweled.

A quantity of miscellaneous gold and silver articles, jewel boxes, incense holders, trays, salt cellars and other objects are gathered in the case given over to jewelry. Practically every type of work is represented, both antique and of later periods.

The collection of personal jewelry is large and varied, especially in the display of necklaces, given by Mr. de Young. There is a quantity of antique jewelry, Egyptian, Roman and from other ancient lands, as well as an exhibit of East Indian work. This East Indian jewelry is the ordinary method taken by the natives of India for

Magnificent specimen of Chinese cloisonne vase over six feet in height, with gold handles. Exhibited in the Panama-Pacific International Exposition.

Massive Japanese cloisonne vase, seven feet high, with solid silver handles and collar. From the Columbian Exposition.

Oriental Ceramic Gallery.

the display of the family wealth. Traveling jewelers go from village to village, carrying their tools with them. Arrived at the home of a patron, they set up their little furnaces, and the purchaser provides them with silver or gold, frequently in the form of coins, to be worked up into necklaces, bangles, anklets, armlets, amulets or other articles.

Modern jewelry is also well represented in a large variety of pieces.

Enamels and mosaics are exhibited in a well-filled case that contains a very valuable collection of these types of work.

Much of the antique jewelry was purchased by Mr. de Young at the sale of the Alessandro Castellani collection at the Hotel Drouot, Paris, in 1884, and later given to the museum. Included in this collection are Egyptian, Etruscan, Roman and Greek pieces, sixteenth century Russian jewelry, Indian work, Louis XV chatelaines and other pieces, and antique Spanish and Italian examples.

Modern Egyptian jewelry and modern European work are also well represented.

Enamels and mosaics are exhibited in a well-filled case that contains a very valuable collection of these types of work.

Enamel is defined as the art of ornamenting any substance with vitreous material which is made to adhere by heat. The glaze on pottery or porcelain is a class of enamel work as well as the making of purely ornamental pieces such as plaques, tablets or enamel pictures.

Cloisonne is the form of enamel work commonly used in the East, but also well known in Europe. It is applied more frequently to vases, dishes or other utensils, or large objects, and is made by filling with powdered enamel the pattern divisions outlined with gold wire.

Champleve enamel is done by cutting into the metal base the spaces to be filled with enamel instead of building them up with partition wires. In this variety the dividing lines may be a part of the pattern by making them of different widths or leaving raised portions to be worked into the design. There are several modifications of champleve work.

Surface enameling is divided into two principal classes—Limoges and "email des peintres," or artists' enamel.

In the early examples of Limoges work the metal base was first covered with a dark enamel surface. The design was then traced on this base and filled in with white enamel. In firing, this white, mixed with the dark base, formed a gray which was to serve as the darkest shadows of the picture. The next coat of white was applied to the picture, omitting these deepest shadows, and the process was continued until the final coat of white was applied only to the high lights, which by the application of successive layers of white enamel were made pure white.

This type of work was done at Limoges as early as 1475, and the best period was from 1530 to 1600. Flesh tints and color were used later, applied at the last firing of the piece under the final coat of translucent enamel. After 1630 stencils were used under the enamel to produce elaborate effects, but the first beauty of the work was thereby lost.

Email des peintres was done in the same way as porcelain was decorated, by painting the design on the enamel and firing it.

The museum enamels include several valuable Limoges specimens, as well as examples of French, English and Spanish work. Notable among them are two Spanish crucifixion plaques and two beautiful

Sevres pieces illustrating the scenes of the reception of the king at the palace of the Duc de Blois and the assassination of the Duke. There are also many beautiful portrait pieces, old French and English of the sixteenth and seventeenth centuries, and such highly artistic examples of "email des peintres" as "The Lovers" and others.

Two interesting pieces are table tops of Sevres make. One of these, with its elaborate gilt framework, has as the central feature an enamel portrait of Louis XV, with miniatures of the ladies of his court around the edge. These miniatures include portraits of Pompadour, Leczinska, De Crequy, Du Barry, Comtesse de Sabian, De Monchy, Duchesse de Berry and Mme. de la Parabere. The second table top is of the same period, with miniatures of court ladies decorating it.

The three principal types of mosaic, Byzantine or Venetian, Florentine and Roman, are illustrated in the museum collection. Byzantine mosaic is distinguished by the use of large pieces of glass, usually square, giving a rather impressionistic effect. Florentine mosaic makes use of the natural veining of the material for shading in the picture, and the pieces are cut to fit the design instead of being tiny fragments put together. Roman mosaic uses very small bits of stone, set in microscopic detail with beautiful effect. The portrait of Columbus and two Venetian scenes hung on the gallery walls are Byzantine; several small pieces in the case, notably a figure of a woman in classic robes, are Florentine, and the Roman work is represented by a reproduction of Guido's "Aurora" and a beautiful table top.

Mosaic is a very ancient art. The Louvre and the British Museum contains examples from Nineveh and ancient Egypt, ivory carvings in low relief decorated with inlay of lapis lazuli. This early mosaic was done on a small scale for use in jewelry and ornaments. The fine Egyptian work was done by drawing bundles of colored rods to extreme thinness and cutting off slices.

The Greeks of the fifth century B. C. began the use of mosaic on walls and columns, and the later Greek and Roman mosaic pavements are famous.

Four principal types of mosaic were used during the Middle Ages; wall decoration of glass cubes; pavements of marble mosaic; more detailed decoration and individual pieces, done in glass, and mosaic of wood.

Elaborate designs were worked out by the fourth century Christians for the decoration of their churches and basilicas, but the art of mosaic declined in the fifth and sixth centuries, and although there was a brief revival in the ninth century, the real revival did not come until the eleventh century, due to Byzantine influence. Then were established the great Italian schools of Sicily and Campania, Venice and Rome.

Mosaic is almost entirely an Italian art, the early Greeks being the only other European people to adopt it. Mosaic work done in other countries was due to the visits of Italian artists, although a little native mosaic is found in Russia. The Moors introduced it into Spain, but because the Mohammedan faith forbids the representation of living creatures they were confined to geometric designs. Curiously enough, the ancient Americans, Incas and Aztecs, knew the art of mosaic, and specimens of their work have been found.

The new Jewel Hall also houses the gold medal presented by France to San Francisco in recognition of the city's heroic recovery from the disaster of 1906. The presentation was made by Ambassador Jules Jusserand at a public gathering held at the Orpheum Theater on June 5, 1909, Edward Robeson Taylor, then Mayor of San Francisco, receiving the gift. The medal, about four inches in diameter, bears on one side a symbolical figure rising triumphantly and casting aside the heavy robe of mourning, and on the other the figure of France presenting a laurel wreath to America.

Miniature Collection

Old Monks Were Forerunners—First in Sixteenth Century—Eighteenth Century Best Period—Fine Examples in Museum.

The old monks who laboriously illuminated their parchment manuscripts were the forerunners of the artists whose brushes created the delicate miniatures that serve to portray the fragile beauties of the court of the Grand Monarque. The early illumination was done largely in red lead, and from the Latin word for this substance, minium, is derived the word miniature. Painters of the manuscript illustrations were called miniators.

As separate pictures, removed from their manuscripts, miniatures date to the sixteenth century. In the ancient volumes tiny pictures of saints and angels are frequent; it remained for the artists of the time of Hans Holbein (1497-1543) to adapt this form of art to secular uses.

Nicholas Hilliard (c. 1547-1619) is the first well-known miniaturist. He was followed by his students, among them Isaac and Peter Oliver (c. 1567-1647), who were the first to give roundness to the faces. hitherto painted in the flat tones of the illuminators. They copied old masters for Charles I and other noble patrons.

Early miniatures were painted on cards—sometimes on the backs of playing cards—vellum, chicken skin and sometimes on bone. German and Dutch painters worked in oil on copper. Ivory was not introduced until the seventeenth century, but immediately became popular. Most miniatures are done in water color on ivory or vellum.

The earliest portrait miniature recorded is a portrait of St. Louis painted in the Credo of the Sire de Joinville (c. 1287). With the introduction of printing, illuminated manuscripts disappeared, but miniatures were well established as separate pictures.

The eighteenth century was the best period of miniature painting. Ivory permitted the use of more delicate colors than earlier materials, and ladies of the court were portrayed in all the dainty finery of their beautiful gowns. Miniatures in enamel were popular from the middle of the seventeenth century, and the popularity of snuff boxes as gifts led to the use of miniatures to adorn their covers. In the eighteenth century tiny miniatures were made for use in lockets and rings.

The art of miniature painting declined in England after the close of the seventeenth century, but revived with the work of Richard Conway (1741-1821).

Miniature painting was introduced into France from Flanders by Jean Clouet (c. 1530). Few examples of the earliest work exist. Jean Petitot (1617-1691) was the first successfully to use enamel and invented new colors. Jean Petitot fils, Jean Baptiste Masse (1687-1767), Pierre Adolphe Hall (1739-1793) were the principal early French miniaturists. The eighteenth century brought many noted painters of miniatures, especially Largilliere, Nattiere and Fragonard. Later, in the Napoleonic era, came Isabey, Dumont and J. B. Augustin.

Mr. de Young has donated a great number of beautiful miniatures to the museum, especially old French specimens and work of the Napoleonic period. Portraits of nearly every famous man or woman of the eighteenth century are included in the collection, members of the royal families, of the nobility and other well-known individuals, both French and English. Kings and queens include the three great Louis of France, Elizabeth, Anne Boleyn, Catherine II of Russia, Marie Antoinette, Mary Queen of Scots, Napoleon and others, as well as a curious set of the five great moguls of India of the eighteenth century.

Miss Sarah Spooner also donated a large number of miniatures of similar types.

The museum miniatures are scattered through the building in individual cases. Some of the best of the Napoleon collection are in the Napoleon gallery. Cases are placed in the various art galleries as floor exhibits.

The Coin and Medal Gallery

Money of All Nations Represented—Napoleonic Medal Collection—American Medals Commemorating Presidents and Special Events—Historical Medals of European Countries—Military Decorations.

Unusually effective and satisfactory is the installation in the coin gallery, where a valuable collection is displayed. The coins are placed in wall cases lined with black, each coin standing on edge on a tiny shelf so that it is easy of inspection. Coins are labeled individually with value and date, and the general classification is geographical, the principal divisions of North America, South America, Asia, Africa, Europe and Oceanica being subdivided into countries.

Practically every country in the world, from the great powers to the smallest Asiatic kingdoms, is represented by one or many coins. There is a large display of antique coins, both European and Asiatic.

In the installation of large groups, such, for example, as American ten-cent pieces, chronological order has been followed so that the student may trace this particular value from its first type to its present form.

The coins from North America include those of the United States, Canada, Mexico and the Central American countries, and from a very complete representation. Similarly, the European collection is large and representative.

From Asia are some interesting and quaint old pieces, such as the ancient "knife coins," which were current in China before the Christian era; porcelain gambling checks from Siam, which serve as unauthorized but popular currency; specimens from the states of India, Burmah, Tibet, the Malay peninsula, and other Oriental and Far Eastern lands.

The African coins have been gathered from all parts of Africa, and since the African natives ordinarily used cowrie shells or articles of barter, the coins are principally of modern make.

South America and the scattered islands of Oceanica, including Australia and New Zealand, are also largely represented.

The exhibit of metal coins is supplemented by a valuable collection of paper money, arranged in book-leaf cases for easy inspection.

In the center of the room stands a large case containing what is probably one of the most complete collections of Napoleonic medals in existence. It lacks only the gold medals to illustrate every medal or token or coin struck during the Napoleonic period in all countries over which the empire held sway. The gold medals are missing not by lack of collection, but by accident. Shortly after the collection was installed in the early days of the museum, the case was broken open and the gold medals stolen, evidently for the value of the metal, as no others were taken.

Notable in this display is a facsimile of the famous Waterloo medal. This elaborate affair, measuring nearly six inches in diameter, was designed and executed by Benedetto Pistrucci by order of George,

Prince Regent of England (subsequently George IV) to commemorate the battle of Waterloo. It is said that the work required seventeen years to complete.

The obverse of the medal shows portraits of George, Frederick William III of Prussia, Alexander I of Russia and Francis I of Austria —a group of rulers that would be exceedingly curious today, but that at that time indicated the opponents of Napoleon; four horses drawing figures of the hours to signify the four points of the compass; a figure of the Prince Regent holding a torch to signify the light that followed the darkness of the Napoleonic era; Iris and Zephyr, typifying peace; Castor and Pollux, typifying Wellington and Blucher; Themis, goddess of heavenly justice, and Night driving a chariot along the lower edge of the medal. The reverse shows Wellington and Blucher, or two figures intended to represent them, with Nike, or Victory, leading them onward; at the top of the medal, Jupiter in his chariot striking down with his thunderbolts nineteen Titans, signifying the nineteen years of the Napoleonic wars.

In spite of the work he put on the medal, Pistrucci never saw it finally struck, for the project was abandoned. The museum specimen is a copper electrotype of the original.

Napoleon had a veritable mania for ordering medals struck to commemorate every occurrence at all out of the ordinary, and also evinced an extreme fondness for portrait medals. This latter class includes specimens showing Napoleon as Hercules, Apollo, Julius Caesar and other inappropriate historical characters; in the uniform of a General; accompanied by Marie Louise, Josephine and other individuals, not excluding Charlemagne; as well as at important moments of his life. The Egyptian, Italian, German and Russian campaigns are memorialized, and the series is completed by medals commemorating St. Helena, death mask medals and others showing the conveying of Napoleon's body to the Hotel des Invalides.

The original collection contained 800 specimens.

Another medal collection of historic interest covers a series of the rulers of France from Pharamond to Napoleon III. Pharamond, noted in the Arthurian cycle, is said to have been the first King of France, his reign being placed between 420 and 428 A. D.

American medals include portrait medals of the Presidents and dies struck by Congress to commemorate special events such as Grant's victories, Perry's victory on Lake Erie, in honor of General Winfield Scott for the battles of Niagara and Chippewa, and so on.

Portrait medals date from the time of Alexander the Great. Previous to that time medals had represented gods, nymphs, animals or mythological beings, but Alexander, being regarded in some sort as a divinity, was honored with a portrait and paved the way for many others. Medal making was brought to a point of high perfection in Greece.

The collection of historical medals is very large and valuable, including many old English specimens, such as that struck to commemorate the coronation of William and Mary in 1689, the cession of New Amsterdam to Great Britain by Holland, and similar events.

One case contains a display of medals won by the schools of San Francisco at various world's expositions, including Paris, 1900; St. Louis, 1904; Guatemala, 1915; Seattle, 1909, and Panama-Pacific, San Francisco, 1915.

The collection of military decorations contains some unique specimens, gathered in France, Spain, England and other countries. The

Spanish decorations include the Order of Charles III, founded 1711; commemoration medal, Battle of Morella, 1849; Order of Maria Isabella Louisa, 1883; patriotic medal for soldiers and sailors wounded in service; Reward for Valor, founded by Isabel II in 1864; Decoration of Loyalty; Military Order of St. Ferdinand, 1811; Order of Benevolence, an order for women founded in 1856 by Isabel II; Royal American Order of Isabel the Catholic, 1815; Spanish Military Medal, and Military Order of Merit, 1864.

From France are the Legion of Honor, military medal, Red Cross medal of 1870; Order of Merit, Expedition to Mexico, 1862, and Italian Campaign of 1859.

The Victoria medal, in the English group, is the last paid for by the East India Company, and is known as the Indian Mutiny medal It was awarded to members of the Ninth Lancers, Bengal Horse Artillery and civilians. There is also a Crimean medal, awarded by Queen Victoria to soldiers who served in the Crimean War. The museum specimen has bars for the battles of Inkermann, Sebastopol and Alma.

Miscellaneous medals include the Belgian Military Cross; Pacification medal given to Russian troops who quelled a revolt of 1849 in Austria; Expedition to China, awarded to French and other foreign troops in China, 1792-1815; Italian Reward of Merit; Order of Kalakaua, founded in 1874 by Kalakaua I at his election to the throne of Hawaii; a medal awarded by Frederick William III of Prussia (1797-1840); the Japanese Rising Sun decoration, taken by a Russian soldier from the body of a Japanese officer slain in a battle of the Russo-Japanese war; a gorgeous star and cross of the Military Order of Christ (Portuguese), founded by Dionysius, King of Portugal from 1270 to 1325, and open to Catholics of noble lineage; the Order of Elizabeth (Austro-Hungarian), conferred on Mrs. G. L. Renstrom by Francis Joseph for services during the Boxer rebellion; Order of Nikhan-Iftikhar (Order of Glory), a French Tunisian order founded in 1857 by Achmed Bey, and the Madagascar medal, commemorating the expedition to Madagascar in 1836.

The Mineral Galleries

A Valuable Collection—Mining Industry of California Well Illustrated—Reproductions of Gold Nuggets—Crown Jewel Reproductions—Silver, Copper and Other Ores—Crystals—Geological Studies.

Eight large double floor cases and spacious wall cases house the museum collection of minerals that is valued at many thousands of dollars. The Max Braverman collection alone, donated in 1901 and containing more than 1200 specimens, is valued at $10,000 and took thirty years to make. Other special collections are included in the general exhibit, as well as many individual specimens.

The mining industry of California naturally holds a prominent place. How the miners of '49 worked is shown in some old prints, with later photographs and drawings showing some of the famous mines and plants of the State.

One case is devoted to gold quartz, principally examples of California gold-bearing minerals, and affords an interesting opportunity for comparison of the quartz from different localities. "Free gold," the gold present in pure form in scales or small nuggets, is illustrated by several specimens, and others show all types of rock in which the precious metal has been found.

Interesting in connection with this exhibit is the collection of reproductions of the famous nuggets of the world. These huge affairs, gilded to indicate their precious nature, are topped by the enormous Welcome nugget, found at Ballarat, June 11, 1858. It was the largest mass of virgin gold ever found, weighed 2166 ounces, was 9 by 20 inches in size, and was valued at $41,882.70.

Other Australian nuggets represented are the Precious, found at Catto's Paddock, Berlin, Victoria, in 1871, which weighed 1717 ounces, was 11 by 12 inches in size, and was valued at $31,577; also the Beauty, found in Kangaroo Gully, Bendigo, Victoria, in 1858, buried only nine feet below the surface. Its weight was 242 ounces, it was 5½ by 8 inches in size, and its gold value was $4714.

A specimen of California nugget reproduced was found in Oregon Center, El Dorado county, and was 2½ by 3 inches in size.

A large Siberian nugget, found in 1842 in the Ural mountains, weighed about 100 pounds and was valued at $22,000.

Also in this collection is a reproduction of a genuine gold brick, the output of the Morning Star mine, Placer county, California, for the month of June, 1898. The original brick was 894 fine and was valued at $28,754.70. It was about twice as large as an ordinary clay brick.

This case also contains souvenirs of the Panama canal, including specimens of earth and rock dirt of the type that figured in the disastrous Culebra cut slides; soil from the bottom of the canal, and a tube filled with strata of earth from Culebra cut, showing the vari-colored nature of the soil. There is also a piece of lignum vitae

railroad tie from the first road laid across the isthmus, a road which was said to have cost one life for every tie laid.

A glittering exhibit in this case is the collection of reproductions of the crown jewels of the world, the largest, the Grand Mogul, that once was the property of the Russian Czar. Others are the world-famous British Kohinoor, the Orloff diamond from Russia, Etoile du Sud, Brazil; Pacha, Egypt; Regent, France; Pigott, England; Kohinoor, India; Nassack, England; Etoile Polaire, Russia; Sancy, France; Schah, Persia; the famous Hope diamond, and the yellow Grand Duc de Toscane from Austria.

Silver, copper, lead and other ores are well represented in the mineral collection. There is a case of unusually beautiful specimens of agate, petrified wood and jasper, brought from all parts of the world. These substances result when the organic matter of wood is replaced by mineral matter, usually silicia, which deposits itself in the cells, crowding out the organic matter, until the wood is entirely transformed. Beautiful effects are the result, especially in veining and coloring, and jasper, agate and petrified wood are known for the wonderful polish they take.

The very complete collection of semi-precious stones shows the gems both in their natural state and polished, and includes specimens of practically every semi-precious stone known to mineralogists, brought from all parts of the world.

The display of rock crystals is particularly large and interesting, especially in connection with the exhibit of completed rock crystal articles in the jewel hall. The natural crystals are shown, illustrating the characteristic shape in which they occur, and the varied colors, amethyst, smoky topaz, chrysophrase, rose pink and other shades, are available for study.

A case of marble specimens shows the various colors, textures and veining.

The mineralogist will, of course, find more to interest him in this room than will the layman, but the beauty of the specimens, their coloring and the graceful form of the crystals appeal to every one who visits the gallery.

The Musical Instrument Gallery

Old Pianos—the First Upright Piano Brought to San Francisco—Percussion Instruments—Cavalry Trumpets—Horns—Trombones, Etc.—Stringed Instruments.

One of the most effective galleries of the 1920 unit, from the point of view of installation, is that devoted to musical instruments. Curator C. D. Penez, in designing this installation, sought to classify the instruments in the wall cases according to type and period, and likewise to effect an interesting and pleasing arrangement of individual displays. With this in view, the shape of the various instruments has suggested their arrangement in panels, radiating groups or other styles.

The floor space is occupied by an exhibit of old pianos, the central exhibit a beautiful example of the French piano of the Louis XV period with a double bank of keys and the framework elaborately painted and gilded. The inside of the lid is adorned with landscape and figure paintings.

Another interesting piano in the collection is the first upright brought to San Francisco. This small instrument, scarcely larger than a cottage organ, standing only a trifle over three feet in height, was brought to San Francisco from Australia in October, 1849, in the sailing vessel Elizabeth Archer, Captain Cobb, by William Thomas Sharp. In the early days of the city Sharp used this piano in giving entertainments, and received $100 a night for his concert programmes.

There are several examples of English Broadwoods, possibly the best-known European make; a French Monniot, dated Paris, 1830; a Debain instrument from Paris, which is a forerunner of the modern automatic piano, and other old pianos of the early nineteenth century.

The history of the piano as such goes back to 1709, when Bartolommeo Cristofori of Italy built four instruments designed as improvements upon the harpsichord and clavichord. These two instruments, which produced their tones when the strings were plucked with quills, lacked variety of tone. Cristofori's "pianoforte," as he named his new instrument, followed the fundamental principles of the modern piano in that the strings were struck instead of being plucked, and lived up to its appellation by producing tones both "piano" and "forte," soft and loud. Like the spinet, it also differed from the harpsichord in using wire instead of catgut for strings, although the spinet keys were plucked instead of being struck.

Until 1760 all pianos were made in the shape of the modern grand piano. Then Zumpe, a German workman in a London establishment, made a square piano, and the type became so popular that London grew into the world center for pianos.

Broadwood in 1790 made many improvements on the piano, especially in the line of the production of a fuller and richer tone. The Broadwood action was substantially the action of the modern piano.

About the end of the eighteenth century piano makers, to save space, tried experiments with upright instruments. At first they

simply turned a grand piano on edge. The first real uprights were patented in England and the United States in 1800 by John Isaac Hawkins, an Englishman living in the United States. These instruments possess practically all the essential features of modern pianos.

The first composition especially for the pianoforte was written in 1773 by Muzio Clementi, who composed three sonatas for the new instrument. Much of the advance in piano construction was due to the work of Beethoven, whose piano compositions were so far beyond the powers of the piano of his day that makers were forced to make improvements to meet his demands for power of tone, range and other features, adding more keys, thicker strings for more tone, and so on.

The Cristofori piano had a wooden framework with four octaves. The modern instrument has a metal framework with more than seven octaves.

Probably the oldest musical instrument was a percussion instrument or drum, manipulated by some primitive man who discovered, doubtless by accident, that a bit of skin stretched over the end of a hollow log gave out a pleasant booming sound when he struck it. The collection of percussion instruments ranged in the museum cases illustrates the descendants of this primitive drum from the native material of African and South Sea tribes to the modern snare drum.

Gourds are favorite drum bodies for African musicians. One unique adaptation of the gourd is the "African piano," used by the Fan tribe in the interior of Africa, which, except for the primitive nature of its construction, is almost precisely like the modern xylophone. Gourds of varying sizes are ranged on a framework and are designed to be struck, giving out the tones of what, to the native African ear, was a scale.

The African tomtoms are usually designed to be rubbed with the hand instead of struck with a stick or mallet. A skilled drummer can produce a tone of tremendous booming power by rubbing his hand over the surface of a tomtom. Voodoo doctors of the Southern States exhibit their inheritance from jungle ancestors by using the same method in their rites, according to those who have studied their weird practices.

Quite probably the native drums that now rest quietly in the museum cases have sounded through the African jungle, perhaps calling the warriors to battle with another tribe or with white invaders.

The South Seas are largely represented in the collection of drums. New Guinea drums with heads of snakeskin, drums from the Marshall islands, Hawaii, Samoa and various parts of Australia, show many types of workmanship.

The Orient also contributes numerous models of drums, including instruments from China of all shapes and sizes, a Japanese drum rudely made from a section of a hollow tree, cymbals, a Japanese bronze gong and similar instruments.

From the Mediterranean countries of the Near East come Turkish and Sudanese tambours, drums and tomtoms, and tambourines from Egypt and Arabia in many forms.

Two interesting American Indian drums are shown, one a war drum captured from the Kiowas and the other a Spanish medicine drum made by the Pueblo Indians.

Among the European instruments are a set of old German snare and bass drums, ornamented with the double eagle; a cavalry kettle-drum used in France in 1804, and a snare drum which from its inscrip-

tion, "Vive la Republique," evidently dates from the days of the French Revolution.

Next to the percussion instruments are the brasses, including trumpets, horns of all descriptions, mediaeval instruments of curious shapes and modern developments. Brass instruments have changed very little from their original conception, except that the freakish types, such as the serpent-mouthed bassoons and curiously curved horns of early days, have disappeared. The principle remains the same.

The collection of cavalry trumpets includes several relics of the Spanish War and other battles. Among the early types are the ancestor of the saxophone, a tuba made at Paris in 1765, the original alto horn, an early model of the slide trombone, examples of the ophicleide or serpent, an oddly shaped horn curved in a double wave and used sometimes in church music; an extraordinary German bassoon and shepherd horn with enormous mouths carved and painted into the semblance of serpents' heads, and a complete representation of modern types.

The woodwinds include flutes, flageolets, oboes, clarinets, sets of pipes resembling Pan-pipes from Turkey, Japanese flutes, bagpipes and other instruments of allied nature. There are several interesting sixteenth century Italian clarinets, showing that this particular instrument has changed but little in the centuries since then, and a number of very old French instruments of the flute type.

The stringed instruments form a most interesting and varied collection. Beginning with the harp, this type of musical instrument has developed through the various forms of lyre, cithern and similar classes, to the guitar family, violin types and, on another side, to the piano, descendant of the first harp that was laid on its side to be played.

Of the earlier types of harp and its immediate descendants the museum exhibits a sixteenth century cithern, an Italian archilute made by Michelle Atton of Venice in 1610 and shaped like a huge mandolin, old Spanish guitars of early Californian days, a sixteenth century Italian theobro with a round sounding box and very long neck, a Spanish mandolin of 1787, a Danish mandolin of the cithern type, a First Empire lyre and other instruments of the Gothic and Renaissance period of varying shapes and design.

From countries of the Far East come the Hindustani bina, which employs the useful gourd as the sounding box of the instrument and has an extremely long neck like the theobro, a triangular kanoon or Arabian harp, Chinese and Japanese harps, some plucked with the fingers and others played with bamboo hammers; an odd-shaped Mexican umbrella harp, a half-cylinder with the strings on the curved side; Turkish, Persian, Egyptian and other guitars, lutes and a dulcimer, presumably of the type on which the "Abyssinian maid" of the poet was wont to play.

The violin family, including stringed instruments played by friction with a bow instead of being plucked or struck, is represented by several interesting examples, old and modern. The collection includes violins, violoncellos, bass viols, violas and allied types, as well as many quaint Oriental instruments, such as the samisen or two-stringed fiddle, the Chinese pou goum or large fiddle, and the yue kin, an instrument with a round sounding box and short neck.

A picturesque development of the violin family is the hurdy-gurdy, associated with wandering musicians. The examples in the

museum show this instrument to be shaped like a large and rather clumsy violin with a keyboard on the top of the sounding box. It is played by the friction of a rosined wheel revolving against the strings, the crank operating the wheel being turned with the left hand while the player manipulated the keyboard with his right hand, stopping down the strings as desired.

The violin reached its point of highest perfection in the seventeenth century when Andrea Amati of Cremona, his sons, Antonio and Jerome, Nicholas Amati, Jacob Stainer of Cremona and Antonio Stradivarius were making the instruments to which their names have been given.

Included in the museum exhibit are several old-time melodeons, accordions, hand organs, concertinas and an odd little hand organ or "organette," known as the "musical marvel," which looks rather like a miniature piano player operated on the familiar principle of a perforated music roll. The melodeons date back to the early nineteenth century; one was used in Maine in 1830 and one came to California around the Horn from Vermont in 1850.

A quaint old music book of 1845 lies in its case opened at "The Star-Spangled Banner," then a comparatively new patriotic air.

The collection of Oriental instruments is very complete and interesting, containing specimens from China, Japan, India and other Far Eastern countries, supplemented by many from Egypt, Persia, Turkey and the countries of the Near East.

Textile and Embroideries Gallery

Sketch of the Development of the Industry—Embroideries—Costumes of Various Periods—Laces—Fans in an Infinite Variety—An Alabaster Model of the Taj Mahal—Dolls—Kimonos.

The industry that began when some primitive man discovered that he could plait together fibers of grass to make a covering for himself, and that today is represented by thousands of busy factories filled with humming machinery—the textile industry—has a history that is as interesting as it is complex. Not only the weaving of cloth is to be studied, but also the many methods of decoration of woven material, embroidery, lace-making, the use of precious metals, the discovery of new fabrics, the adaptation of cloth to many purposes and the whole history of costume, so closely identified with the progress of the art of weaving.

The weavers of ancient Egypt, Assyria, Greece and the other countries of the world of antiquity knew only one type of work, shuttle weaving in simple designs. Their materials were spun wool, flax and possibly cotton, and they had not developed the art of weaving patterns into their materials that was later to grow into the great industry of tapestry making. Colors were of the simplest, red, purple or yellow, done with vegetable dyes, and the product of their looms was plain texture or woven in stripes or plaids.

The weaving of these ancient peoples was essentially the same as that done by the present-day natives of undeveloped lands, the Indians, South Sea islanders and Asiatics.

Elaborate patterns in weaving originated in the Orient. The Chinese, possessing the secret of silk for perhaps 2500 years before the Christian era, developed more complex looms on which to weave this delicate and beautiful thread. As trade grew between China and Europe, coming through Persia, India and the Levant, these attractive designs came to the notice of European weavers and stimulated them to turn out work of equal quality.

That impressively named Emperor of Rome, Heliogabalus, who flourished in the third century A. D., is said to have been one of the first, if not the first, Roman ruler to attire himself in robes all of silk from the Orient. From the third to the seventh century the Persian trade with Rome, and later with Byzantium, brought Europe all the silk it knew, but in the sixth century two of the missionary priests, whose activities did so much to weld together the distant parts of the world, brought home—tradition says in a hollow stalk bamboo—some silkworms and cocoons, with the secret of their use.

Under the reign of the Emperor Justinian, in the sixth century, a practical monopoly of silk was established in Rome. Silk weaving was restricted to certain establishments where women weavers were employed. Naturally silk was very costly, and only royalty and wealthy nobles could afford to wear the new materials.

With their hatred of worldly display the early Christian leaders denounced the wearing of rich silks, but found the new material excellently adapted for the purposes of church adornment. Ecclesiastical embroidery on silk began to appear in the fourth century, notable for the lavish use of gold thread. One early tenth century maniple is described as being of "woven gold, with spaces left vacant for needlework." Like so many examples of early textile art, this particular piece was later used to render last honors to a saint, and served at the burial of St. Cuthbert.

With the textile industry well established in Asia Minor and growing in the Italian peninsula, Spain received it, as she received so much else, from the Moors, who took their knowledge of weaving with them when they made their invasion.

The next wholesale importation of textile art into Italy came when Roger Guiscard (Roger of Sicily), in 1147, made a raid on Attica, sacked Athens, Corinth and other cities, and took back with him to Palermo a number of Greek weavers. These workmen brought a knowledge of Byzantine art to the Saracenic weavers already working in Sicily, and the result was a very rich and beautiful form of textile art.

In the thirteenth century this new industry extended into Italy, and Florence, Milan, Genoa, Venice and Lucca became the centers of textile development. Almeria, Granada, Valencia and other Spanish cities were already developing the art extensively.

An interesting form of weaving of this time was the making of small pieces on miniature looms. Nuns and noble ladies spent their time weaving these richly decorated pieces and embroidering stoles, maniples, bands and other pieces for church use.

The early fabrics popular with weavers and embroiderers included sarcenet, taffeta, camora and similar materials, with fustian for commoner use. Later the manufacture of satin, damask and brocade was developed, and about the end of the fourteenth century the weaving of velvet was tried. One very popular weave, known as baudekin, was of silk and gold. The material was much used for altar canopies, and the Italian term baldachino, now applied to this form of church decoration, is derived from the name of the old-time material.

The names of many materials indicate their origin. Satin comes from "aceytuni," applied to silks of Mediterranean make, a word which became "zetani" and later the familiar "satin." "Damask" is from Damascus, "velvet" from the Italian "velluto," or "shaggy"; "muslin" from Mosul, "gauze" from Gaza, and so on.

Satin is mentioned in English records of 1350, when the cathedral of Exeter received a gift of satins from Bishop Grandison.

The revocation of the Edict of Nantes served to scatter French Protestant textile weavers into England and France, and thereby stimulated weaving in those countries.

Linen damask was woven in the flax-growing countries of Saxony, Flanders and Northern France. As late as the fifteenth century is was rare and valuable. Only wealthy persons could afford linen tablecloths, and they seldom had more than two or three in their establishment. French Protestant refugees of the seventeenth century assisted in the development of linen weaving in Ireland, where native weavers had already begun to make the damask for which the country became famous.

Textiles and embroidery of the Middle Ages were very elaborate. Old records tell of jeweled and embroidered robes so heavy that the

unfortunate clergy compelled to wear them could scarcely walk under the weight. Even as late as the seventeenth century massive and elaborate effects were the rule for court costumes. The pictures of Elizabeth of England and her courtiers show them wearing such a tremendous weight of decoration that modern garments seem fragile indeed.

Embroidery is the earliest form of decoration of textile fabrics, preceding the weaving of patterns. The oldest piece of embroidery known is a linen robe found in the tombs of Thebes and embroidered with the cartouche or signature of Amenhotep II, whose reign was fifteen centuries before Christ.

No specimens are known of the Babylonian and Assyrian embroidery shown in their tomb paintings, and the Greek examples are fragments in wool taken from tombs of the fourth century B. C.

In Rome embroidery was called "painting with the needle," but the work done in ancient Rome itself has perished. Such examples as exist are from the Egyptian tombs of the period when Egypt was under Roman influence.

With the establishment of the Christian era, embroidery began to survive. By the time that Constantine was reigning at Byzantium embroidery was a well-known art. A famous example of that time is the dalmatic of Charlemagne or Leo III, kept in the treasury of St. Peter's. Some authorities assign this to the twelfth century instead of to Charlemagne, but at all events it is very old and exceedingly elaborate, with its silk and gold decorations and embroidered pictures.

Palermo of the twelfth century was the next center of embroidery, the art developing along with that of weaving when Roger Guiscard forcibly imported his Greek workmen.

National styles began to show about this time, and the application of embroidery to ecclesiastical purposes brought about the creation of wonderful pieces that have survived the centuries, due to the care given them in the churches.

Probably the best-known piece of embroidery in the world has masqueraded under a misleading name for centuries. It is the Bayeux tapestry, which is not a tapestry at all, but embroidery on linen. A reproduction of a portion of this famous work hangs in the European textile hall at the museum, made by Emma Debussy, wife of Claude Debussy, the composer.

The Bayeux tapestry is a linen band 230 feet long and about a foot and a half wide, embroidered for its entire length with the scenes of the exploits of William the Conqueror. Tradition says that Queen Matilda, wife of the great fifteenth century adventurer, did the work herself with the assistance of her maids. For many years the famous work dropped out of sight, until a student of textiles found it hung in the nave of the Bayeux Cathedral, where little or nothing was known of its importance. It is now hung in a special building at Bayeux, built solely to house it, and from which is was once removed to Paris to be exhibited at the order of Napoleon.

The naive portrayal of battle scenes, armies on the march, diplomatic parleys and other episodes of William's history is delightful. Rules of anatomy are regally discarded, and horses and men of extraordinary structure parade down the picture. Latin inscriptions above the pictures remove all doubt as to what the scene represents. The colors are also oblivious of rules; red and blue are scattered through the picture as if the workers had picked up whatever skein happened to be closest at hand.

After the fourteenth century the history of embroidery in Europe may be briefly summarized. In England the fourteenth and fifteenth centuries saw a decline, with a revival beginning in the sixteenth century and developing into a recognized school in the years that followed. The London Company of Broderers was incorporated during the reign of Elizabeth and flourished until the execution of Charles I, when the stern Cromwellians discouraged embroidery and the demand fell off.

Much excellent work was done in France, especially in church embroidery. A book of rules was published in the fourteenth century by Etienne Boileau governing the work of the "embroiderers and embroideresses of the City of Paris," in which, among other items, night work was forbidden because of poor light. Men were largely numbered among the embroidery workers of mediaeval times instead of leaving the industry to women.

After the fourteenth century Italy developed a notable school of work, especially in Florence. The leading painters thought it no waste of time to design patterns for embroidery, and magnificent ecclesiastical pieces were turned out.

Spain showed the Moorish influence up to the fifteenth century, when Italian styles began to creep in. A Guild of Embroiderers was in existence in Seville in the early fifteenth century, and a similar organization flourished in Toledo.

German embroidery showed Byzantine influence in the twelfth and thirteenth centuries, later developed a national style in bold and heavy patterns and color. Cologne was the principal center.

The northern nations developed the art in later centuries.

Painting and jewelry were introduced as accessories of embroidery in the sixteenth century, when precious stones were first sewn to embroidered garments. Royalty liberally patronized the industry, the elaborate costumes worn at the mediaeval courts calling for a vast amount of work. Royalty itself dabbled in the art. Katherine of Arragon, Elizabeth of England, Mary Queen of Scots, Catherine de Medici, Anne of Brittany and many another royal and noble woman of the time "wrought with her needle."

Asia began to embroider in early times. The beautiful effects of embroidery on silk were recognized centuries ago by the Chinese, who later taught their art to the Japanese and to other peoples. Indian embroidery used quantities of tinsel and gaudy adornment. Japanese embroidery tended toward the pictorial, and painting was often used to supplement the needlework.

Persia applied embroidery to carpets and other fabrics, and in spite of Mohammedan prohibitions used figures in the design as well as floral or geometric patterns.

The principal stitches of mediaeval embroidery were the chain stitch, each taken through the loop just laid; tapestry stitch, close single stitches of uniform size on special canvas; satin stitch, long, smooth stitches of irregular length, and couching, solid masses of gold or silk thread laid on the material and sewn by long and short stitches at right angles. Embroidered sections were often cut out and appliqued to a brocade background, and this method of work was recommended by Botticelli as especially durable and satisfactory for church embroidery.

The Memorial Museum is fortunate in housing an unusually fine collection of embroideries, made by Mrs. Magdalena Nuttall and placed in the museum in her memory by Mrs. Hilda Nuttall. More than 200

"Merope," the Lost Pleiad. The most wonderful creation of Randolph Rogers, great American sculptor. This work is eight feet high. Statuary Hall.

pieces are included in this collection, which took thirty years to make. It was formerly in the Fritz William Museum at Cambridge, England, and is valued at $60,000.

The Nuttall collection includes samples of needlework, embroideries and laces from Norway, Sweden, Denmark, Russia, France, Spain, Italy, the Netherlands, the British Isles, China, Japan, New England, and many specimens of ecclesiastical embroideries of the fifteenth to eighteenth centuries.

Especially fine are the Italian pieces, representing the best work of the sixteenth and seventeenth centuries. Among the examples are seventeenth century Roman embroidered bands, several Calabrese church pieces of the sixteenth century in beautifully designed patterns and heavy embroidery, a Sicilian table cover made in a Palermo convent; framed samplers, work done in convents and a quantity of old ecclesiastical examples, collection bags, altar cloths, chalice veils and so on.

The Spanish work includes some of the embroidery done at Seville in the seventeenth century, a conventionally patterned towel from Toledo of the same period and some fine examples of Mexican work, such as embroideries from Oaxaca, where the best Mexican work is done, and embroideries, including a portion of the Madonna's dress, from the Church of San Antonio Abad, one of the oldest churches in the City of Mexico.

Many beautiful Russian pieces are included, hand-woven towels embroidered in the characteristic reds and blue; a bridal headdress and veil, not of the conventional lace of the Western world, but of heavy black satin elaborately embroidered in gold thread; bits of peasant costumes and decorative examples.

The brilliant hues used by the Balkan nations are shown in Bulgarian and other work. France is represented by many good pieces, including some rare Provencal embroidery and many examples of lace work.

The general display of textiles and embroideries in the gallery devoted to Occidental textiles includes numerous samplers and pictorial embroidery, among which are some very old church pieces in frames, one eleventh century piece representing Christ and the Virgin.

Two interesting scarfs show the work done by the Almaras Indians who ruled Peru and Bolivia in the early days. The fabric was woven from homespun threads and colored with vegetable dyes, the formula for which is lost. These specimens date from the Spanish colonial epoch, and the work is no longer done.

The sheer pina cloth woven by the Filipinos is shown in its just-completed state and in garments made from its thin texture. Moro and Filipino embroideries are also included.

An interesting relic is a handkerchief, once the property of Rosa Bonheur and given by her to her protege, Anna Klumpke. The handkerchief is comfortably large and is elaborately embroidered with a conventional design surrounding two stags and the initials R. B.

This gallery also houses a valuable collection of costumes of various countries and periods. Several Bavarian peasant costumes are exhibited, showing the full pleated skirts, heavy bodices with a veritable armor-plate of embroidery, and the jeweled headdress. The dresses are in brilliant red and blue, and were designed as wedding costumes in the late seventeenth and early eighteenth centuries. Odd-shaped national headdresses are caps with fan-shaped adornments of gold lace and long black drapes.

Among the old bits of costume are a Spanish satin waistcoat of the Louis XIV period, elaborately embroidered; an old Spanish opera cloak of velvet, heavily embroidered, worn on gala occasions in Granada; several wedding vests of brocade; an eighteenth century German bodice with heavy gold braid and spangles; two faded old Bavarian silk umbrellas; a blue and red Bulgarian costume, showing the typical embroidery in cross-stitch; several bead bags of the English and American colonial period; shoes worn at a ball given by Washington; early nineteenth century patchwork quilts and blue and white hand-woven bedspreads; quaint old lace carriage parasols; a calash, or enormous poke bonnet of brown silk, worn in 1718; colonial poke bonnets, and finally a large number of gowns donated by San Francisco women of years gone by. Mrs. M. H. de Young gave several of the gowns, with their odd old bustles, lace frills and sweeping skirts, and hats of marvelous style.

The lace collection in the museum is very large and representative. Miss Sarah Spooner donated a fine collection of laces of many types, and other donors have supplemented her gifts.

The history of lace is one that has furnished material for many books, and the beautiful material itself has always been popular with collectors. The most ancient specimens of lace known are knotted hair nets found in the tombs of Thebes, which date back to about 2500 B. C. The oldest large pieces which more nearly resemble the lace of today are two albs, one said to have been woven by St. Clare and her nuns and worn by St. Francis of Assisi (1181-1226) and the other worn in 1298 by Pope Boniface VIII and now in the Sistine chapel at the Vatican. Both albs are of linen, ornamented with lace like drawnwork. Many portraits of early churchmen show their robes adorned with lace.

The first lace was made with a warp or net, like weaving. Needle lace, in which designs are made by laying threads over the main line of the pattern, drawn on paper or other material, and fastening them together with stitches, and bobbin or pillow lace, in which threads, each wound on a bobbin, are guided around pins that outline the pattern on a pillow and woven together to form the lace, are later developments. Machine lace imitates both these varieties. Although needle lace is known as needlepoint, all point lace is not of this variety. Point is a general word for lace, derived from the Italian "punto," likewise used as a general term.

Rules for English nuns of 1210, in modernized form, direct the nuns to "make no purses nor laz (lace), but shape and sew and mend poor men's clothes and church clothes." This was evidently lace for secular use; for making lace for church purposes was another matter.

Special patterns for needlepoint and pillow lace date from the early sixteenth century, when pattern books were first published.

Lace takes its particular name usually from the place where it was made and where a special style was developed. So the museum collection includes Point Argentan, Brussels tape and point, Point d'Alencon, Honiton (an English establishment founded about 1568 by Flemish refugees from the Alva persecutions), French applique, English thread, Spanish raised point, Milano, Gothique, Filet Veneziano, Fiandra, Duchesse, Mechlin, Burano, Byzantine, Rococco, Rose Point, Point d'Angleterre, Chantilly and so on.

The Kinsey collection, presented by Mrs. M. A. Bates in memory of her mother, Mrs. Isabel Rogers Kinsey, and son, Griffith Kinsey, contains some fine specimens of Flemish rose point and other types, and a rarely beautiful lace over-jacket in fine tracery.

Romance has always surrounded the fan, and perhaps no exhibits in the museum are so touched with the charm of personality as the fans exhibited in this room. Mr. de Young has long made a hobby of fans, and some of his most wonderful specimens are here shown, including a fan that was once the property of Marie Antoinette of France.

Fans have been known from remote ages, probably from the time that primitive man or woman discovered that a gently waved leaf would mitigate the summer heats. Legend surrounds their invention, nevertheless; picturesque Oriental stories of the maiden Lam-si, who taught the art of the fan to Chinese courtiers, and other tales. Ancient reliefs of Egypt and other nations show figures carrying fans. They are mentioned in the old Sanskrit writings of India and in the oldest Oriental volumes.

In ancient times fans were not only devoted to their present use, but served as standards. In China of the twelfth century B. C. they were used as battle standards and a general commanding three army corps carried a fan of white feathers. Fans were carried by Princes and Generals in Egypt of the same period and round fans of peacock feathers were popular forms.

Folding fans had their origin in Japan and were imported into China, reversing the usual order of things. Legend says that the wings of a bat suggested the principle.

In Italy of the eleventh and twelfth centuries fans were of feathers or other materials, and their ivory and gold sticks were set with precious stones. They were used by the ladies of Portugal in the fourteenth century and were known in England and France about that time, although they did not come into general use until Catherine de Medici came to France from Italy and brought Italian customs with her.

The seventeenth century saw the beginning of the cult of the fan. Fans were called the "screen of modesty," "useful zephyr" and other poetic names. By the eighteenth century painters and other artists began to devote their attention to fans. Louis XIV in 1678 gave permission to a community of workmen to call themselves Master Fanmakers, and about that time painting on silk was introduced.

In the seventeenth and eighteenth centuries, the glory of the art, fans were of ivory, tortoise shell, mother-of-pearl or other rich materials, carved with the delicacy of lace. Their mounts were of satin or vellum, painted in water colors. Some of the most beautiful fans of the period are of chicken skin, which possesses a texture especially well adapted to painting.

Odd little fans perforated with many holes are said, by tradition, to have been carried by court ladies going to the Porte St. Bernard for air and incidentally to peep at the bathers.

Under Maintenon's austere rule, fans were smaller and less adapted for purposes of flirtation, but under the Regency the fan resumed its supremacy. Then it was written: "The most thoroughbred lady, one made up of every grace, who is ignorant of the art of playing with this pretty trinket, would meet with the ridicule of the world."

In the period of Louis XVI fans were painted after subjects by Watteau, Lancret and other noted artists. Fans "en vernis Martin," which were greatly prized, were treated with the delicate varnish invented by Martin, a carriage painter (c. 1475). This compound was especially adapted for fixing delicate paintings, and fans signed "vernis par Martin," are even more valued than those signed with the name of the artist.

During the Revolution fans ornamented with cockades or decorated in the tricolor served as badges for the women adherents of the cause.

Under the Directoire, fans were often of crepe and spangled in elaborate designs. The First Empire brought the tiny fans shown in Recamier and similar portraits. Anagrammatic fans in which the sticks bore letters and could be transposed or shifted to form different words came with the Restoration. Verses were often inscribed on fans.

In the early years of the nineteenth century, dandies carried fans for a brief period, but soon went back to canes.

Later years saw a revival of the Louis XVI fan making, with good imitations.

The de Young fans are placed in two large floor cases. They include beautiful and very valuable old French specimens, with sticks of wonderfully carved ivory, as fine and delicate as lace. Odd-shaped feather fans are included.

Marie Antoinette's fan is placed in a case near the door where there are other specimens, including a magnificent fan of black Chantilly lace.

Other fans, given by Miss Spooner, Mrs. Morton Mitchell and other donors, complete the display. Every fan in the gallery is worth individual study for its beauty of design, delicacy of material and graceful shape.

Oriental textiles are placed in an adjoining gallery, making a display that is almost dazzlingly brilliant in color. In the center of the room stands a Chinese bridal chair, upholstered in heavy crimson and gold brocade. In such a chair the Chinese bride, hidden from the world, rides to the home of her husband, whom she has probably never seen.

This gallery also holds the alabaster model of the Taj Mahal, the wonderful Indian palace tomb built by Shah Jehan in the early nineteenth century for his favorite wife. The cost of the original was estimated at $20,000,000, and before it was despoiled, the marble walls with their delicate tracery of carving held rare jewels. The Taj Mahal is at Agra, India, and is 186 feet square and 220 feet from base to dome.

A unique exhibit is the collection of Japanese dolls, presented by the Japanese commission to the Panama-Pacific Exposition and illustrating Japanese historical costume. The dolls are such as are used in the Hina Matsuri, or doll festival, which occurs yearly on March 3. This is the day when the small girl of a Japanese family is its most important member. Booths are built with shelves for the dolls, which are arranged in regular order, emperor and empress and court nobles on the top shelf, with the lower shelves kept for play dolls of everyday use. Refreshments are prepared on miniature dishes and served to the dolls. The teaching of the day is "reverence and respect for parents and the sanctity of the home."

The museum collection, arranged on the traditional shelves covered with vivid red silk, forms a historical group. The central figure is an empress, who, at the death of her husband, went to the head of his army in Korea. She was accompanied by the warrior, Watanabe-no-Tsuna, and an array of Generals. Her child she left in the care of an old man, aged 1000 years, who was probably considered to have accumulated sufficent wisdom in that time to attend to the needs of the royal infant.

The group, costumed in the elaborate style of the legendary period, includes the Emperor and Empress in their coronation robes, attended by the Ministers Sadaijin and Udaijin; three maids of honor, five musicians, the Emperor's banner and shoe bearers, an ox cart and an old man and woman, supposed to have lived together for untold ages

and signifying old age and happiness. The fan which the Empress holds was to be used as a signal in battle.

Other dolls in the same display illustrate costumes of a later period, about 1770.

Chinese embroideries of rare beauty are shown in this collection. Mandarin coats are embroidered in solid masses of silk and gold. Rich brocades are used to drape the backgrounds of the cases, and rare shawls, fans, scarfs, panels and other pieces are shown.

Among the kimonos is a bridal costume of the early eighteenth century of white brocade, with a rich floral design. There is also a magnificent kimono of shaded gray, lined and wadded with burnt orange and embroidered with an elaborate design of flowers and peacocks, as well as a beautiful midnight blue costume, embroidered with flowers and lined with orange.

Turkish and Persian embroideries are represented by scarfs, table covers and other pieces, heavily embroidered in gold threads and silk. There is a beautiful door panel, designed to be hung to cover the door casing, that is richly adorned.

From India came the display of shawls of cashmere and embroidered specimens, such as the shawl that is solidly embroidered in deep wine shades and blue, with figures of men and birds. Jeypore caps, scarfs, dresses, drapes and tapestries complete this collection.

Arabian and Egyptian work is shown in saddle trimmings, heavily fringed, used by the Arabs; embroidered banners showing the persistence of the ancient design; bits of costume, scarfs and veils. Among the interesting pieces are the aba and kaffiyeh, native cloak-like garments, worn by Ferdinand de Lesseps at the opening of the Suez canal, November 6, 1869, and presented to Mrs. Washington Ryer, the only American woman to make the trip through the canal at that time. Dervish infantry uniforms, or, rather, portions of uniforms, show gaudy red and blue squares.

Statuary Hall

A Gallery Spacious in Extent Filled With Specimens of the Sculptors' Art—Original Statues in Marble and Bronze and Reproductions in Plaster—the Great Dore Vase—Storey's Statue of King Saul—the Merope of Rogers—Reproductions of Antique Roman Busts—Well Filled Annexes.

Perhaps in no class of exhibit does the Memorial Museum possess a more representative collection than in examples of the sculptor's art. Statuary Hall, with its spacious extent of 140 by 48 feet, is filled with marbles and bronzes that, with very few exceptions, are of high artistic value. A gallery is devoted to plaster reproductions of the work of ancient Greek sculptors, and in several of the art galleries are found excellent bronzes, classic reproductions and modern conceptions.

The student of these matters may, indeed, extend his investigations into other exhibits in the museum. The Oriental gallery furnishes examples of Japanese and Chinese wood carving and modeling; there is a splendid collection of the crudely hewn stone idols of the ancient Aztecs, and many other galleries contain bits of modeling or carving.

The greater part of the sculpture is placed in Statuary Hall, for several years the main entrance to the museum. Here are the particular treasures of the exhibit; the Dore vase, said to be the largest and finest example of modern bronze casting in the world and a masterpiece of art; the magnificent "King Saul" of W. W. Storey, and another Storey example, the splendidly powerful figure of "Delilah": Randolph Rogers' "Merope," a very beautiful conception, and Andreoni's "Eve."

Standing in the center of the hall, the Dore vase instantly attracts the eye by its very massiveness and impressive size. Some ten feet in height and weighing about 6000 pounds, this enormous bronze vase is at once a single artistic conception and a mass of careful detail that repays the closest study.

Gustave Dore sought to typify "The Vintage" when he designed his great vase. It is the story of the vine, from the base, where quaint little Cupids battle with the insects that would destroy the vine, up through the full luxuriance of rich fruit and swaying tendrils to the topmost group of Cupids eagerly squeezing the juice from the ripe grapes. The massive nature of the design takes on new emphasis when it is realized that in the groups about the base are fourteen plump little Cupids and half a dozen insect foes; on the body of the vase among the tendrils of the vine, thirty-six Cupids, seven Bacchantes, four Satyrs and old Silenus himself; and perched about the topmost rim eight more Cupids. And the tremendous task undertaken by Dore is appreciated in the study of the individuality of these figures. Each one, from the tiniest Cupid to the jovial Silenus, was separately modeled, then placed in position on the vase and neces-

sary adjustments of pose made to build it into the complete composition without losing its individual appeal.

From six different points of view the Dore vase presents a satisfying and harmonious picture. This is accomplished by festooning the heavily laden vine in three huge loops about the body of the vase, with a group of figures placed in each loop and at each point of attachment. One loop holds Silenus and the Cupids who make merry with him; one has the lazily graceful figure of a Bacchante, one arm outstretched to hold a roguish Cupid up where he can squeeze a ripe grape cluster into his cup; one holds a Bacchante with a sly little Cupid nestling close to her ear to whisper secrets. At the point of attachment are other groups—one a Satyr, evidently overcome by wine and helplessly defending himself against the merry assault of a band of Cupids and Bacchantes; one a Bacchante with upheld cup, and one a Satyr who has seized a Bacchante and is carying his prize away through a rout of Cupids.

Entwined about the entire vase is the symbolic vine, hung thickly with clusters of grapes, and every cluster and every leaf an individual study in modeling and composition. The wee Cupids at the base fight valiantly against an army of spiders, snakes and insect enemies almost as large as themselves, and at the top perch more Cupids, peering eagerly into the depths of the vase. Each figure is complete in its design and individual humor—the tiny Cupid who has lost his balance and is slipping off the vase, quite obviously shrieking for help; the Cupid who sits with both arms clutching an enormous fly; the impetuous Satyr and his not unwilling prize; Silenus, old and fat; the slim Bacchantes and all the rest.

The Dore vase has a romantic history. Several months of the sculptor's time went into the modeling of the original. Then he contracted with Thiebaut Brothers, a famous bronze foundry of France, for a casting. It was duly made, but Dore, with traditional artistic improvidence, had not considered how he might pay for it, the bill reaching a total of some 60,000 francs.

Left with the vase on their hands the foundry owners sent it to the United States to be exhibited at the Columbian Exposition in Chicago, hoping to recoup themselves for their expenditures by charging admission to see the vase. Through the influence of Mr. de Young, the vase was sent to the Midwinter Fair in San Francisco, and, like so many of the treasures of that exposition, found its final resting place in the museum. The story of its final purchase is a romance in itself; a story of offers made and rejected, of the desire of the foundry owners to hold out for a higher price, and at last of the conquering effect of 50,000 francs in actual cash spread before the eyes of the French owners of the vase. In this way it happened that the Memorial Museum became, for the comparatively small sum of about $10,000, the possessor of an art treasure that is now valued in the hundreds of thousands of dollars.

So far as is known, this is the only copy of the Dore vase in existence. In the process of casting the original model was destroyed. For some time, the story went, another model, perhaps the first clay study, was in Rheims, but whatever this model may have been, it was destroyed in the German advance, and San Francisco now owns the only existing example of the famous vase.

At the Midwinter Exposition the vase was exhibited by the French foundry authorities; after its purchase for the museum it stood out-

side the door of the original unit for years until its proper setting was found in Statuary Hall.

Next to the Dore vase the greatest treasure of the statuary exhibit is the magnificent marble figure of "King Saul," the work of W. W. Storey, recognized as one of the foremost figures in American sculpture. The presence of this splendid work of art in the museum is due to the generosity of Mr. de Young. The statue originally cost $12,500, and its value is now placed at $250,000.

King Saul is represented as a man of advancing years, with long beard and features molded into superb strength. He is seated on a throne chair of simple design, its low back modeled in relief. The King's left hand is clenched in his beard; the right rests on the ball of his scepter. The left foot is pushed far forward, the knees drop apart, and the head is bent and slightly turned to the right. It is a pose of utter simplicity but of magnificent power; the relaxation of the body is that of intense thought, a relaxation with an unconscious tenseness apparent in every line. The right hand, resting on the scepter, holds the ball with an unrealized force; the veins stand out on the back of the clutching left hand. There is a splendid firmness about the flesh of hands, arms and face, and through the heavy robe that drapes the figure one receives the suggestion of powerful muscles.

The carving of the drapery is strongly simple. A fringe at the bottom of the robe and a heavy jeweled belt are the only decorations that break the smooth sweep of the drapery. Between the knees the robe sags apparently of its own weight, and the fringe lies on the floor about the King's feet with a suggestion of actual substance.

The simplicity of the general design is extended to the face. Saul's thoughts are moving in deep waters, in dark places. He is brooding and stern, majestic and sorrowful—and all this the sculptor has indicated by the force of modeling rather than by exaggerated facial expression, supplemented by the expressive modeling of the hands.

Another fine example of Storey's work, also illustrating his strength in the use of powerful and simple lines and broad composition, is "Delilah," a marble figure slightly larger than life size, which was bought for the museum by Mr. de Young for $7500.

The figure is that of a woman standing with her left foot slightly advanced and her right hand raised to hold the heavy drapery that falls from waist to feet. The upper half of the body is nude; the only decoration is the necklet of barbaric design and the circlet that holds the flowing hair in place.

The strength of the figure lies principally in the great sweep of line from the head to the end of the drapery that lies upon the ground behind, the fine balance of the pose and the firmness of the flesh with its suggestion of hidden muscular strength. Weakness of body or spirit is far from this woman, who combines the allure of her beauty with a cold determination that would drive her steadfastly toward her goal.

Two very different feminine types are the "Eve" of Andreoni and Randolph Rogers' lovely "Merope." Where "Delilah" has strength and purposeful vigor, these have yielded charm and wistfulness.

"Eve" is a nude figure, seated on a rock with the left foot drawn and raised and the left knee sharply bent. In her upraised right hand she holds the apple, which she regards with a gentle curiosity rather than eagerness. Her hair is loose and flowing. About the rock on which she sits and about the base of the composition twines the serpent among flowers. Andreoni has portrayed a highly idealized

Eve in the almost sentimental contours of her face. The flesh modeling suggests softness; an interesting contrast to the force of the "Delilah." From the same medium of marble one sculptor has made a texture of firmness and solidity, while the other has hinted at yielding plasticity.

In beauty of composition and successful solving of an exceedingly difficult sculptural problem, "Merope" is foremost. Rogers chose for his subject the lovely figure of the Lost Pleiad, cast out of heaven because of her love for a mortal and forever drifting through houseless space in search of her lost love and her lost sisters. The figure of Merope is poised in flight, the beautiful curve of the body and the fluttering draperies about the feet filled with the suggestion of rapid motion. The upper half of Merope's body is swung to the left, her left hand raised to shade her eyes that look out on the vastness of space with an expression of terror and wistfulness. Heavy drapery is brought from the right shoulder around the waist, covering the lower half of the body with thick folds that float behind the figure with a suggestion of sweeping motion. An especially notable element in this figure is the splendid balance of the composition. There is no artificial support for the outflung arms and shoulders, as so frequently occurs in a pose of this nature, the weight of the draperies about the feet serving to balance the figure.

The statue of "Merope" is valued at $10,500.

Four interesting bronze groups are reproductions of the famous Versailles fountain groups, representing the four elements. Each composition includes three chubby children, standing back to back so that the group is complete from whatever angle it is viewed. Lespignola, the sculptor, has avoided abrupt changes of subject by the skillful use of directing lines; an upraised arm leads naturally to the pose of the next figure, or a wreath flung over a plump shoulder carries the line around the group.

The Roman busts, the purchase of which formed Mr. de Young's introduction to Paris auction rooms, stand in this gallery. They represent five Roman Emperors—Hadrian, Augustus Caesar, Nero, Marcus Aurelius and Antoninus Pius, all in white and veined marble, and a Homer in black marble. All are excellent types of portrait sculpture, massive and effective.

An unusually interesting piece, both from subject and medium, is the black basalt figure of a negro slave, an Italian example of sixteenth century work. Black basalt, distinguished from the darker shade of marble by a difference in texture, takes an extremely high polish and is most effective in sculpture, although seldom used. The composition shows the upper half of the figure, rising from a pillar. The arms are behind the body, evidently bound there; the shoulders are raised and pushed forward and the head is sunk back on the heavy neck. There is a sense of strain and heave about the writhing shoulders and of muscular tension in the lines of the neck and head that is excellent.

"Love and the Dolphin," a reproduction of an antique original found at Capua, Italy, is a curiously interesting composition. An enormous dolphin rests its head with huge open mouth on the ground, its body thrust upward and twined twice about the slim young body of Love, whose arms embrace the dolphin's head and whose feet protrude from the coils of the dolphin. During the Panama-Pacific Exposition this piece stood in the exposition grounds, and exposure to

the weather gave it the beautiful green patina or satiny finish that is now its striking characteristic.

Two very lovely marble heads contrast Italian and American work; "Inspiration," by Giuseppe Bessi, and Hiram Powers' classic "California." The former is an example of the combination of marbles, an alabaster white for the face and a delicately brown-veined marble for the drapery. "California" is a type of the utmost classic simplicity, a face of purity and sweetness, with the hair caught in a knot. The lines of the neck and cheek are exceptionally lovely.

Raffaello Romanelli is represented by two marble figures, "Jeanne d'Arc" and "Cleopatra." The pose of the two statues is very similar; standing, with head and shoulders thrown back and body slightly turned, "Jeanne d'Arc" is pictured in full armor, holding her sword and gazing upward with a rapt expression. "Cleopatra" holds the asp in both hands, applying it to her left breast. She wears a heavily draped costume with elaborately barbaric girdle.

Several famous antiques are represented by excellent bronze reproductions, some done by Chiurazzi of Naples, whose work is well known. Among these are the two Centaurs, the Elder and the Younger. The originals stand in the Capitoline at Rome. The Elder Centaur has swung his body sharply to the right and his right hand is clenched behind his back. The Younger Centaur faces straight forward and his right arm is upraised. Both are very spirited and animated figures.

The Louvre Jason is shown in an excellent bronze reproduction of the familiar figure of the youth standing with his right foot raised on a rock, his hands at the fastening of his sandal. Another widely known antique, here in reproduction, is the Discobolus.

The Farnese Homer is reproduced in Carrara marble, and there is a bronze reproduction of the Flying Mercury, the original of which is in the Bargello, Florence.

A figure that invariably attracts attention is the heroic bronze reproduction of the Dancing Faun of the Borghese galleries, Rome. This spirited statue has caught the Faun in a moment of his dance when he has paused in the step to swing his cymbals before him. The left leg is advanced and the right foot raised lightly on the toe, while the body is swung sharply to the left and the hands, holding the cymbals, are raised.

A small bronze is the reproduction of "Venus with the Sword of Mars," the original being in the Uffizi galleries at Florence. Venus stands beside a tall vase, holding the sword in her left hand, while her right hand is raised to catch the drapery at her shoulder.

An unusual piece is the bronze reproduction of the memorial bronze to Elizabeth Boott Duveneck, whose tomb is in the cemetery at Florence, Italy. The figure of a woman in simple draperies lies at full length on the slab of the tomb, carved in half-relief.

"Vanity" is a graceful little marble, a female figure holding a mirror, the other hand raised to her hair.

Two heroic marbles are the statues of Lincoln and Washington by P. Bianco. Lincoln is shown standing with the left foot slightly advanced and a pile of books at his feet to give firmness. His right hand and arm are advanced in the gesture of a speech, and his left hand is thrust carelessly in the pocket of his trousers, pushing the coat back in rumpled folds. There is an effectively quiet dignity about the figure, an easy handling of line and careful attention to details of clothing.

The Washington statue is planned in a somewhat similar pose, showing Washington in uniform and hatless, wearing a sword. The right hand is raised and caught in the buttons of the coat.

Another Lincoln memorial is the small marble representing "The Emancipation Proclamation," representing Lincoln with a negro slave kneeling at his feet, freed from shackles. T. Ball is the sculptor.

"Flora" is a large marble, the nude figure of a woman standing beside a pillar over which flowers twine, a spray flung about her body and flowers in her upraised right hand.

Mary Garden posed for the figure of "Salome" by G. Ganboge, a marble of considerable detail. Salome is shown leaning easily back against a wall of veined marble. Her skirt drapery falls away from her advanced right knee, and she wears a heavy girdle and breast jewels. Her right hand is raised to her breast and the left rests very firmly on the wall. She wears a curious headdress of curls and feathers.

Two odd little busts are "Hopi Man" and "Hopi Girl," by J. J. Mora, heads that show the characteristic Indian features and the whorls of hair worn by the woman.

"Apollo and Daphne" is a small marble by Romanelli after the original by Bernini in the Borghese, Rome. It shows Daphne at the moment of her transformation into a bay tree, the bark beginning to rise about her legs. Appollo, pursuing, is at her shoulder.

Historical interest attaches to the small statue of "The Mahdi," bronze with gilt, for it was presented to Marshal Canrobert after his return from service in the Orient during the reign of Napoleon III, Henri Pie is the sculptor.

Smaller pieces include Haig Patigian's bust of John M. Keith; "Young Man Praying," a reproduction in bronze of a Berlin original; "The Rape of Polyxena," a bronze group, a reproduction of the original in Loggia dei Lanzi, Florence; "Cleopatra," a marble bust by C. del Sarta; a Chiurazzi bronze reproduction of the Donatello "David" in the National Museum at Florence; "Rebecca at the Well," a marble group that was exhibited at the Paris Salon of 1910; "Hymn," a small marble, the kneeling figure of a young woman, by Alice Nordin of Sweden, and Paul Troubetzkoy's interesting bronze bust of M. H. de Young.

There are also in Statuary Hall two Corsinovi busts of Wallenstein and his daughter, Shelka; A. Bortone's "Dancing Girl"; "Carmen," a Bertini wood carving; "The Dancer," by C. Lapini of Florence; "Drummer Boy," an elaborate wood carving by Massimiliano of Florence; "Bacchante," an effective marble bust; Angelo Bertozzi's small marble, "Modesty"; "Rebecca," a small marble by Andreoni, a bust of Sherman by Simmons and a number of smaller groups.

An interesting group which stands in one of the halls of the old unit is "The Strike," by a Japanese sculptor, Osao Watanabe of Tokio. It is a most effective composition centering about the sturdy figure of a Japanese workman, standing firmly balanced, with muscles tense and hands clenched. To his left arm clings the drooping figure of a Japanese woman, three children clustering about her. The group is modeled in broad lines, angular and bold, with a suggestion of the Rodin school in its handling.

Seven splendid bronzes that stand in the art galleries adjoining Statuary Hall are the animal groups, six by Sirio Tofanari and one by Vanetti. These are groups of the Barye type, although somewhat heavier and rougher in their modeling, the figures often blended with

the supporting background. Particularly good in its sleek strength is the "Leopard," which occupies the center of one of the smaller galleries, a bronze some three feet in length, showing the animal in the intensity of the hunt, the steel muscles drawn taut, ears laid back and lips pulled away from the teeth in a snarl.

There are two groups of "Struggling Tigers," one by Tofanari and one by Vanetti, portraying the tigers in the thick of combat, lithe bodies flung into the fight, every muscle tense.

A larger group is "Lioness and Cubs," the lioness stretched at ease and the cubs crowding to reach the mother.

"The Caress" is a notable group for its sense of deliberate, easy motion. A lioness lies at full length, head raised. Behind her moves the lion, rubbing his head slowly along her shoulder. The easy lift of the lion's great neck and forequarter muscles, and the slow stretch of the extended hind leg, are vibrant with a sense of luxurious power.

Few artists have used camels for any other purpose than to give the proper atmospheric touch to desert scenes, but Tofanari in his camel group has found a new interest in these ungainly beasts. Like "The Caress," the camel group portrays a moment of demonstration when one of the animals, standing, has drooped his swaying neck to place his head cheek to cheek with another camel, lying on the ground. The rough modeling of the figures is particularly successful in its suggestion of a camel's shaggy hide.

These animal bronzes, as well as the Borghese "Dancing Faun," the two "Discus Throwers," "Jason," the Farnese Homer and several classic reproductions, first came to America at the time of the Panama-Pacific Exposition, sent by the Italian Government for exhibition at the Italian pavilion, from which they were bought by Mr. de Young.

"The Troika," a Lanceray bronze, is a spirited group representing a Russian sleigh ride. Three horses at full gallop draw the sledge, and the two passengers, clinging to the sides of the sledge, indicate the recklessness of the pace.

Two bronze gazelles are reproductions of the originals found at Herculaneaum, near Pompeii, in 1765, and two bronze reproductions of "The Runner," also discovered at Herculaneum, attract attention largely through the realistic sculpture of the eyes, which are equipped with rather startling pupils.

"L'Addio" is a graceful little bronze group by Vanetti, picturing a Roman soldier in full armor bending from his horse to kiss a woman who stands on tiptoe.

Thorvaldsen is represented by a bronze "Hebe," a figure of simple and effective lines.

Three examples of Paul Troubetzkoy's bronzes are found in these galleries. One, "Dante," is a curious conception in heavy pyramidical lines. The base is a truncated pillar with sloping sides, at the summit of which stands the poet, wrapped in a heavy robe, the angular lines of which carry out the design of the base. Scenes in low relief adorn the pillar, which has a flying figure about its top.

This gallery has a number of bronze reproductions of classic heads, including the Verrochio "David" in the Florence National Museum, "Paris," "Venus," "Minerva" and two Michelangelo busts, the Medici dukes Lorenzo and Giuliano, the originals of which are in the Church of San Lorenzo at Florence.

Eight busts of French historical characters, purchased by Mr. de Young from the French pavilion at the Panama-Pacific Exposition,

complete this exhibit. The busts represent Francois de la Mothe Fenelon, Pierre Corneille, Sebastian le Pretre de Vauban, Michel le Tellier, Jean Baptiste Colbert, Maurice de Saxe, Jean Baptiste Racine and Pierre Mignard.

A gallery recently installed that has attracted unusual attention from its first day is that devoted to plaster casts, the principal exhibit being the magnificent series of Indian figures by Dallin, famous for his sculptures of Indians.

Cyrus Edward Dallin, the sculptor, was brought up in the Wasatch mountains of Utah, and from boyhood knew the Indians of that region in all the phases of their life. As a youth he worked in the mines at Springfield, Utah, where he made his start as a sculptor in a manner that is more like romance than sober fact.

The Springfield miners one day uncovered a vein of soft white clay. Young Dallin, in whom artistic stirrings were making themselves felt, experimented with the clay and modeled two heads. Local pride sent the heads to Salt Lake City for display at a fair, and there they were seen by two wealthy men who became interested in the boy sculptor. Funds were raised to send Dallin to Boston, and there he studied with Trueman Bartlett, making rapid progress in his work. In 1888 he was awarded the gold medal of the American Art Association at New York for his "Indian Hunter." Twenty-five examples of his work were seen at the Panama-Pacific Exposition, and many Eastern museums are glad to own Dallin Indians.

Dallin has always chosen his subjects from the Indians he knew so well, and years of study and experience fitted him to model the Indians with perfect accuracy as well as the highest artistic appreciation.

The fourteen examples in the Memorial Museum are arranged in a manner that displays their beauty to the fullest advantage. Filling one end of the small gallery, the group centers on "The Supreme Appeal," a magnificent mounted figure, the original of which, in bronze, is in the Boston Museum of Fine Arts. Two half-circles of mounted and large standing figures radiate from the central point, and the corners are balanced with groups of three figures each.

"The Supreme Appeal" pictures an Indian warrior in the moment before battle, making his prayer to the Great Spirit. The superb figure, clad only in breech-clout and sweeping war bonnet, is mounted on an Indian pony, bareback and with only the primitive bridle of the plains rider. The warrior has thrown both arms wide and his head is flung back in the ecstasy of the appeal. There is a magnificent lift and poise to the figure and a splendid dignity that holds even the most casual passer-by with its impressive strength.

Directly behind "The Supreme Appeal" is "The Medicine Man," a mounted figure placed in profile. The medicine man, wearing a curious headdress adorned with buffalo horns, holds his hand upraised with an easy gesture.

In the first half-circle of supporting figures are "Chief Antelope," a warrior standing beside his pony, with one arm resting easily on the pony's back; "Chief Washakie of the Shoshone Tribe," a strongly dignified mounted figure in full war panoply, right hand raised in salutation; "Cayuse at the Spring," a quietly pleasing group that pictures a pony with head bent to drink and ridden by a young man, behind whom clings a small boy; "On the Warpath," an alert and vigorous figure of a young warrior with a single feather in his hair, mounted and turned sharply to the left, his left hand raised to shield his eyes as he peers back over the trail.

Two mounted figures still farther back in the grouping are "Pretty Eagle of the Crows," a warrior on his pony, holding a musket resting against his body in an easy pose, and "The Scout," a sharp and alert figure, gazing straight forward with hand raised to his eyes.

The corner groups, each including a large figure and two smaller supporting ones, complete the display. On the left, the central figure is "Indian Archer," a strong, easily posed figure with bow raised and right hand drawn back on the bowstring. Flanking him are "Chief Joseph of the Nez Perce Tribe," a dignified standing figure closely folded in a blanket, and "Standing Elk," also in blanket and war bonnet.

The central figure of the right-hand group is the only woman of the fourteen figures, "Sacajawea," the Indian woman who guided Lewis and Clark on their Northwest expedition when other guides refused to go. She is pictured as a young woman with papoose slung on her back, wearing a long dress of deerskin. She is posed in the act of walking, her right arm extended to point the trail and her body swung in an easy step forward. The flanking figures of this group are "Massasoit," wearing the blanket and holding a peace pipe resting in the crook of his arm, and "The Peace Pipe," picturing an Indian of dignified and friendly bearing, extending the pipe in greeting.

From these representatives of the New World the visitor is transported to the historic days of Europe by a glimpse of the plaster casts that adorn the walls. Twenty-nine replicas of relief from the Alhambra recall the art of the Moors. The collection includes capitals, rosettes, panels and fragments, all showing the characteristic Moorish style in construction and ornamentation.

Even those persons who have but a slight acquaintance with the history of art have come to recognize a certain type of plaque, modeled in relief, as a della Robbia. The della Robbia "bambini," chubby babies wrapped in swaddling clothes with their arms extended, are copied in every medium. The Memorial Museum possesses some exceptionally good plaster replicas of these plaques, reproductions of originals by Lucca and Andrea della Robbia, Donatello, Benedetto de Maiano, Settignano and Ghiberti.

The della Robbias were a famous family of artists in mediaeval Florence. Lucca della Robbia, founder of the family, transmitted his genius to sons and nephews, so that with many hands busy at the task a vast quantity of work was turned out. Lucca della Robbia is declared to be excelled, among sculptors of the period, only by Donatello, and as a worker in plastic materials he is unsurpassed. Impatient with the slowness of work in marble or bronze, della Robbia set himself to invent a new method, and discovered the art of enameling terra cotta. These enameled plaques were almost indestructible. The terra cotta base gave them strength and the colors were permanent, since they were put on under the protecting enamel. The design was first executed in terra cotta and painted with fireproof colors. This was covered with a coat of the hard smooth enamel invented by della Robbia, and the whole was fired.

The museum examples of della Robbia work include replicas of the famous bambini, plaques modeled with Scriptural subjects and sections of the beautiful Cantoria frieze by Lucca della Robbia himself, the original of which is in the Museum of Santa Maria del Fiore, Florence. This frieze is adorned with groups of singing boys and girls.

Donatello, who is also represented by replicas of some of his best pieces, is regarded as the founder of modern sculpture and the artistic progenitor of Michelangelo. As a youth he was trained in Florence to the goldsmith's trade. With his friend, Brunellschi, young Donatello

went to Rome. There the two boys worked as goldsmiths in the morning hours and in their leisure time studied the ancient sculpture, digging among the Roman ruins, then still holding many of their treasures, for more examples. When they returned to Florence, Donatello took rank as the foremost sculptor of the age and Brunellschi became equally famous as an architect.

Donatello revived the art of bronze casting, making in 1453 the first bronze since ancient Roman days. With him began the artistic renaissance that swept over Europe and produced the treasures of the Middle Ages.

A further example of plaster replica are the five sections of a frieze that was formerly in the Hotel de Bourgtheroulde, Rouen, and is now in the Louvre. It represents the meeting of Henry VIII and Francis I on the famous Field of the Cloth of Gold, and is a spirited composition, crowded with armored knights on prancing horses, foot soldiers, camp followers, noblemen and attendants, following the two kings.

The Exhibit of Tapestries

A Sketch of the Art of Making Tapestries—Their Manufacture Promoted by States and Potentates. The Gobelin—Aubusson—Renaissance Design.

Although the golden age of tapestry did not come until the early years of the fifteenth century, the art is an exceedingly old one. Ancient Egyptian and Coptic records give authority for the existence of woven pictures as far back as the third century B. C. Fragments of these antique tapestries exist in a few museums, but only fragments, since in the warlike years of the first ten centuries of the Christian era little heed was paid to the preservation of such easily destroyed objects of art as tapestries, and only those pieces survived which were fortunate enough to remain hidden in security.

It was largely due to the monasteries of these centuries that the few examples of antique tapestry have come down to the present day. Great lords and ladies of the time frequently made rich gifts to chosen monasteries and nunneries, among these gifts richly woven hangings to cover the harsh stone walls. In the comparative security of the monasteries, almost the only places which were reasonably free from the destruction wrought by mediaeval conquerors, the tapestries and other objects of art rested safely.

Tapestry has been defined as a picture cloth in which the design is an integral part of the fabric; in other words, woven, and not embroidered. The Bayeux Tapestry, so-called, which pictures the exploits of William the Conqueror, is embroidered, and therefore not tapestry, strictly speaking.

Two classifications of tapestry were made by the French artists who wrought in the fifteenth century—"tapisserie de verdure," or tapestry in which the design was of flowers or landscapes, and "tapisserie des personnages," which pictured scenes involving human beings. Two other general classifications of tapestry are familiar to the student—high-warp and low-warp, referring to the manner of weaving, and Gothic and Renaissance, referring to the style of design.

All tapestry is woven on the same general system, by the passing back and forth of shuttles filled with colored threads. The high-warp tapestry is woven on a loom on which the fabric stands perpendicularly; low-warp tapestry on a loom on which the fabric lies horizontally before the weaver. The best of the Gothic tapestry was woven on high-warp looms.

The tapestry weaver works with the back of his completed piece before him. The right side of the tapestry is not visible; he guides his shuttles by a pattern, working always on the wrong side.

Of recent years the weaving of tapestry has once more been taken up as a means of artistic expression, and some very beautiful and well-made pieces have been the result. It is a revival from the degeneration into which the art fell after the early years of the nineteenth century and the late eighteenth century, when the weavers who once made great hangings of splendid artistic value cheapened their art by applying it to chair covers, cushions and articles of daily use.

The first tapestry factory on record was established at Poitiers about 1025. In the years that followed, the Crusades brought to Europe not only a craze for Oriental design but a desire for the luxurious furnishings of the Orient. The Crusaders found the cities of the East filled with objects of art, including rich embroideries and tapestries, and the trophies they brought home stimulated the art of Europe.

With the lessening of constant warfare over Europe that marked the late thirteenth and early fourteenth century, the "infant industry" of tapestry weaving took on new strength. Noblemen, turning from battle, took thought for the adornment of their castles. The rough stone walls of their castle galleries and halls were displeasing to their newly acquired taste for the beautiful; they began to discover that the harshness could be softened by textile hangings, and orders began to pour in to the tapestry weavers.

If the thirteenth century saw the beginnings of tapestry weaving on a permanent basis, the fourteenth century marked the beginning of established factories, and the fifteenth brought the full flower of the Gothic style.

During the thirteenth and fourteenth centuries Arras and Paris were the centers of tapestry weaving. Arras, indeed, was so definitely recognized as a tapestry center that the name of the city was applied to the fabric and the hangings that covered the castle walls in the Middle Ages are again and again referred to as the arras. Polonius hides "behind the arras," where Hamlet's sword finds him.

Tapestry weaving in Paris suffered an eclipse when Henry V of England occupied the city in 1422 and did not revive until the time of Henri IV (circa 1600), when there were five factories in prosperous condition. Arras maintained her lead under the patronage of the Dukes of Burgundy until 1477, when Louis XI conquered the city after the death of Charles the Bold. This gave Brussels, Liege, Bruges and other cities their opportunity as the guild of weavers scattered to seek safety elsewhere, so that by the sixteenth century the industry was widespread.

Tapestries of the Middle Ages were not spread flat on walls, protected by glass and frames, as they are today. They were objects as much of use as adornment; they served as gifts exchanged between rulers and diplomats; they were called into service when ambassadors met to frame treaties and it became necessary to provide suitably elaborate surroundings for these important personages; they were used to decorate cities for royal entries. Many a meeting of diplomats to make formal end of a war was held in a tent or the otherwise rude surroundings of a poor room made beautiful with hangings of tapestry. It is recorded that on the occasion of the entry of a queen into Paris the streets from the Porte St. Denis to Notre Dame were hung with tapestries, suspended from the balconies of the houses to make a way of beauty for the royal lady. Many a noble traveling about the country had in his train a sumpter mule laden with tapestries and whenever he paused for no matter how brief a stay at castle or fortress his apartments were hung with his own tapestries.

The tapestry weavers of the fifteenth century were true craftsmen. They were not so much workmen as artists, able to create their own designs as well as execute them. The weaver of Arras was usually a member of the guild, an organization with rigid rules and requirements. Severe penalties were inflicted for misuse of the art. No piece of tapestry could be sold until it had been examined, approved and sealed. Misuse of labels meant the loss of the weaver's right hand. While the weaver was permitted to introduce additional decorations

or to adapt designs, within certain limits, a professional artist must be engaged to furnish the original cartoon or the weaver was subject to heavy fine.

Tapestries were customarily marked with the names of the town, factory and, frequently, the weaver. In 1528 an edict provided that Brussels tapestries more than six ells long must bear in their margin the name of the maker and the official designation of Brussels work—two capital Bs flanking a shield.

The Gothic tapestries of the fifteenth century are declared to be the most beautiful of all. The earlier artists wove designs of quaint fancy, suggestive of fairy legend. The figures were dignified and the faces serious. There was no perspective, but a naive mingling of foreground and distance that lends a quaint charm to these early examples. A forsaken maiden leans from the turret of a castle half her own height; men and horses of impossible anatomy fight battles of impossible complications. The beauty of these old tapestries is very largely in their naive ignoring of the principles of drawing, their clear, simple color and their unconscious dignity.

Later Gothic tapestries show increasing elaboration. Instead of the single pictures of earlier days several scenes appear on one tapestry, sometimes separated by columns. This architectural motif is an aid in identification; a tapestry with Gothic arches is evidently of the earlier period before the Renaissance introduced classic forms.

A characteristic feature of the Gothic style is the constant presence of flowers. The heroes and heroines of Gothic tapestries invariably stand in meadows sown thick with quaint little blossoms; flowers even grow in battle-fields. These flowers are always small and delicate; it remained for the Renaissance to introduce huge blossoms and heavy designs.

Borders on tapestries originated with the weaving of a plain edge to receive the hooks on which they were hung. This edge was unadorned until some mediaeval weaver tried the experiment of letting the flowers of his design spill over into the border. The effect was pleasing and borders gradually grew more elaborate, until they were made wide and heavy, as elaborate in design as the main picture.

In 1515 the Brussels factories received an order from Rome that was to be the turning point of the industry. Pope Leo ordered the weaving of the tapestries picturing the Acts of the Apostles to be placed in the Sistine chapel. The cartoons or pictures were done by Raphael, Peter van Aelst was the weaver, and the work took some four years, Pope Leo paying the equivalent of $130,000 for the set.

With these Raphael cartoons the influence of the Italian Renaissance entered France and Flanders. By contrast with Gothic art, the art of the Renaissance was heavy and voluptuous. Instead of the quaint, somewhat crowded scenes of earlier days, the cartoons showed few figures, freer drawing and more colors. The style of the Italians, excellently adapted for painting, was not suited to the delicate art of the weaver, and tapestry making suffered thereby.

Moreover, the Flemish artists attempted to imitate the Italians, and, failing to grasp their spirit, copied only the grossness of the Renaissance style, exaggerating it into looseness. Although the greatest artists of the period—Raphael, Titan, Andrea del Sarto, Veronese, Paolo Romano and others—drew tapestry cartoons, their failure to grasp the peculiar requirements of the art and the failure of their Flemish imitators to recognize the real quality of the Italians, led to a thorough misunderstanding that was the death knell of art in tapestry, in spite of the fact that it was to flourish for many years.

Fourteenth century French shrine, in deeply carved wood, ornamented with gold and color work. Gallery of Religious Exhibits.

Another source of danger lay in the fact that where the fifteenth century weaver had been permitted to exercise his own fancy in details of the design the Renaissance artists insisted that their cartoons be copied without deviation. Hence it was not necessary for a weaver to be an artist; an experienced workman was sufficient, and inevitably the work began to deteriorate.

The third and perhaps the greatest factor in the downfall of the art was the introduction of additional colors. The workmen of Arras manufactured their own dyes of a purity and strength that has kept them bright and unfaded to the present. They used no more than twenty colors, but all good. By the time the Gobelin factories were established in 1662 no fewer than 20,000 tints were used, and little care was given to their permanence.

The increasing demand for tapestries proved the final blow. Just as the art of Oriental porcelain making deteriorated with the growing Western demand, the tapestry factories rushed their work, paid small attention to detail and little to quality. By 1775 the Aubusson weavers themselves admitted that their work was coarse and poor. Large tapestries were made in sections and sewed together and the art fell so low that portions of a tapestry in which the woven color was poor, were tinted with colors that soon faded. At last tapestry weaving on miniature looms became a fad of the nobility, and even a King of France had his little loom with which he toyed idly in his leisure hours.

Francis I of France established the first royal tapestry factory in that country, a short-lived affair, located at Fontainebleau. The industry was sporadic until the beginning of the seventeenth century, when royal patronage was again extended. Louis XIV in 1667, under the advice of Colbert, established the Gobelin factory and tapestry making at once became a leading industry.

The original Gobelins, Jean and Philibert, were merchant dyers in scarlet, who, at the end of the fifteenth century had their atelier on the banks of the Bievre, a stream in the Faubourg St. Marcel, Paris, whose waters were particularly well adapted to their secret processes of dyeing. In 1601 Marc Comans and Francois de la Planche, Flemish weavers, installed their shops on the banks of the Bievre, a district to which the Gobelins had already given their name. In September, 1667, the minister, Colbert, to whom so much of the artistic glory of the Louis XIV period is due, established in the buildings of the Gobelins a royal manufactory of furniture, metal work, tapestries and other articles for use in the palace.

Louis XIV was extremely generous to artists, and with their market assured, the Gobelin weavers made rapid progress. It lasted for only a brief period, however, since by 1688 other demands on the royal treasury cut down the appropriations for the factory. After a period of inactivity (1694-1697) the factory was reopened, peace having been made with Holland, and under the regency of Philippe d'Orleans and the later reign of Louis XV the artists had their way. Then it was that attempts were made to substitute tapestry for painting; portraits were woven, unimportant designs used, and the art followed the trend of the age, reaching its height under Louis XVI, of smallness and perfection of detail. Incidentally the fact that the palaces of the seventeenth century had much smaller rooms than the great halls of the mediaeval castles had its influence on the size of the tapestries.

The history of the times and the spirit of the court are reflected in the tapestries. The gay reign of La Pompadour and the austere rule of Mme. de Maintenon had their effect. The latter is said once

to have manifested her somewhat prudish nicety by insisting that garments be woven and patched into tapestries portraying classical subjects, that the scantily clothed figures of nymphs and dryads might be properly garbed; a demand that would qualify Maintenon for membership on the Board of Censors of the period.

After the period of Louis XVI another blow fell upon the art of tapestry weaving. Already it had degenerated into the manufacture of chair covers and futile little decorations; the leaders of the Revolution, regarding tapestry as abhorrent because it had been patronized by royalty, destroyed quantities of pieces and put an end to the manufacture. Under the Directoire tapestries were burned for the gold and silver in their threads. Only 100 workmen were left at the Gobelin factories, where there had been nearly a thousand. The Revolutionary censors were exceedingly strict; any subject that could remotely suggest royalty was banned. Tapestry weavers were confined to harmless flowers and classical subjects.

Napoleon patronized the Gobelin factories, but insisted on taking them under his personal control. He exercised strict supervision over the work; no design might be woven without his approval, and he kept the workmen busy weaving portraits of himself and his favorites. Tapestry weaving became merely the task of copying paintings.

So the art remained at its lowest ebb, until the modern era brought new life. The nineteenth century saw the old factories re-established and the work started anew under the direction of capable artists. Modern tapestries, woven according to the best methods of the past and picturing designs made especially to be woven, are as beautiful in their way as were the fifteenth century masterpieces.

Although the Gobelin factory was the principal French establishment, other factories did important work. The Beauvais tapestries are from a factory founded by the indefatigable Colbert in 1664 and conducted less as an artistic center than as a commercial enterprise. Oudry, the principal artist of the Beauvais works, was known for his animal paintings, and consequently the Beauvais tapestries frequently portray dogs, horses, cats, birds or other living ceatures. This factory was also known for the sets of tapestried furniture it turned out.

The Aubusson establishment goes back to early years when the Saracens of the time of Charles Martel in 732, scattering from the defeated invading forces, settled at Aubusson and began to practice their Oriental art of weaving. There was no factory, of course, until later years, but by the time of Louis XIV the work was established. Louis XIV, with his characteristic royal prodigality of promises, assured the Aubusson workers that he would patronize the works and send artists to assist them, but he failed to carry out his promises and the factory lost ground. The Edict of Nantes (1685) deprived the establishment of its Protestant workers, including some of its best artists, and it languished until the eighteenth century, when its new growth, lasting until the present day, began.

The best-known English establishment was Mortlake, in London, dating back to James I and patronized liberally by Charles I.

In Italy, tapestry making was almost altogether under the patronage of the great families, and rose or fell with their prosperity or downfall.

The Memorial Museum contains a number of examples of tapestry, principally of the later periods. They are hung in Statuary Hall.

The best piece in the collection is "After the Victory," a large tapestry of the best Brussels period. This fifteenth century piece

shows the characteristics of the superb Gothic work, the freshness of color, minute detail of composition, spirited action, wealth of flowers and elaborate border. Its superiority to pieces of later date in the museum collection is easy to distinguish.

"After the Victory" represents a King, seated under a canopy and surrounded by his court, receiving the news of the battle from warriors and messengers. The figures, while crude as to drawing, are spirited and distinctive, and the strong reds and blues of the coloring are as fresh today as when, 500 years ago, the weavers of Brussels dyed the threads. The intricate mingling of groups in the middle distance, the architectural details of the castle, seen in the background, and the profusion of flowers in the meadow are all characteristically fifteenth century Gothic.

An "Arras" in which time has dealt harshly with the colors is the Flemish piece representing a battle scene with two mounted knights fighting in the center of the picture.

"Peter the Hermit Starting on the Crusade" is another example of the mingling of many small scenes, filling every corner of the composition.

Animals and birds were always popular with the weavers. The museum has an example of this form of design in the small panel that portrays two ostriches, drawn with careful fidelity to nature. The ostriches stand under heavy-leaved trees, their thick foliage typical of Renaissance art, and in the distance are other birds.

The beginning of the deterioration of Brussels tapestries is illustrated by "The Stag Hunt," a composition which calls for identification before one is really convinced that it is intended to represent Diana pursuing a stag. Diana is the most substantial of goddesses who, with very little disguise, might pose as one of the plump Renaissance angels; the stag is an amazing animal, and the miscellaneous array of hunters who surround Diana are surprisingly constructed. The poor dyes used by weavers of the late sixteenth century are illustrated in this piece. The grass is a harsh green, trees are blue or brown, a muddy brown does duty for a flesh tint, and the pure colors of the earlier tapestries are lacking.

Of the Aubusson examples, the largest is "The Last Supper," a piece which has been valued at $20,000. Its date in the seventeenth century places it in the period just before the work at this factory began to grow careless, and the coarseness of the weave is a suggestion of the beginnings of the later poor work.

An Aubusson example showing the tendency toward small pieces and incidental scenes, characteristic of the French tapestries, is that which pictures a scene outside an inn on the river bank. Another small Aubusson, credited to the sixteenth century, is "The Kite."

Eight Gobelin panels are typical "tapisseries de verdure," with their graceful landscapes.

"Curing the Sick" is a wool Beauvais tapestry, credited to the eighteenth century. Its colors are good, especially in the red, brown and blue tones of the robes.

Three panels are from still another factory, the source of Braguenie tapestries. These show the characteristic French adaptation of the Renaissance designs; the figures of the women in the pictures combine the full and broad firmness of the Italian style, with a certain grace and daintiness that is typically French. The style is that which reached its height with Watteau and has become identified with his name. The colors of this piece are delicate and fresh, vivid rose pinks and blues and a clear green.

The Ceramic Collection

Pottery, the Oldest of Arts—a Sketch of Its Development—Oriental and European Productions—Modes of Decoration—Pottery Produced Under Royal Auspices—Sevres Porcelain—Oriental Porcelain—the Cloisonne Lions of the Ceramic Gallery—British Pottery—Glassware.

Oldest of all the arts is the art of pottery. Very early in the dawn of the world primitive man discovered that the clay of the river bank could be formed into rude shapes that would dry in the sun and serve to supply his exceedingly simple household wants. With the exception of the cave dwellers of the Palaeolithic period, whose fragmentary relics do not include pottery, the art was practiced by all known prehistoric peoples from the Neolithic age downward. Pottery making, therefore, apparently developed some time during the Stone Age.

The peoples of antiquity have left many examples of their skill in pottery. The tombs of Egypt, the ruins of Greece and Rome and the older countries of the Near East, the buried villages of less civilized tribes, all yield vast quantities of potters' work. Pottery in the Orient goes back thousands of years before the Christian era. Chinese official annals first mention the manufacture of pottery in the year 2698 B. C.; porcelain was first made in the Orient under the Han dynasty of China in the years between 185 B. C. and 88 A. D., some 1600 years before Europe learned the secret.

During the Dark Ages, in the first few centuries of the Christian era, the art of decorative pottery making disappeared in Europe, returning when the Moors invaded Spain in 711 and brought with them their secrets of Oriental decoration. The pottery they made during their stay in Spain was the prototype of Italian majolica.

Ceramic art covers two great divisions, pottery and porcelain. Under the first head come the coarser varieties, made directly from the clay, and either glazed or unglazed. Porcelain is composed of two basic materials, kaolin or white clay and petunze or feldspathic rock. Both of these are granitic in character; kaolin, the product of the decomposition of feldspar contained in granitic rock, and petunze, the granite itself, or an allied rock in a weathered condition. The hardness of porcelain depends on the proportion of the kaolin, and it was the lack of knowledge of this substance that kept European potters from learning the secret of porcelain for so long.

Pottery is made by modeling by hand, by shaping on the potter's wheel, which keeps the mass of clay revolving while the pressure of the workman's hand shapes it, or by pressing in molds and uniting the parts of the object. "Biscuit" is clay after it has been shaped and given its first baking in the kiln and before any surface finish has been applied.

Glaze is applied to pottery by dipping the object in a bath in which the powdered material of glaze—practically the same as enamel—is in

a state of suspension. Covered with this fine glaze dust, the article is again fired, and the glaze melts and covers the surface with a hard, transparent film.

Decoration is applied to both pottery and porcelain in three principal ways: by adding coloring matter to the glaze itself, by painting a design on the glaze-dusted surface before the last firing, or by painting on the glazed surface and firing the articles sufficiently to heat the glaze slightly and fuse the colors with it. The first method gives a body color to the object; the second restricts the artist to the few colors that will stand the extreme heat of firing and forbids the use of intricate patterns because of the danger of the color spreading; the third is the method used for fine pieces.

Differences in the glaze divide pottery into three further classes; unglazed, or with a very thin glaze, which includes all terra cotta; that with a thick opaque glaze, including majolica and the various types commonly called faience; that with a heavy transparent glaze, including stoneware, English pottery, etc.

The second class of pottery was introduced into Europe by the Moors, whose invasion of Spain, whatever its political or economic significance may have been, was of great importance to the artistic life of Europe. They continued the manufacture of this ware decorated with metallic iridescence, due to partial reduction of the metallic oxides in the pigments, during their stay in Spain, and the ware became known as Hispano-Moresque. The decorations of the Alhambra show one application of the art. Malaga was the first center of pottery making; later a factory was established at Majorca, where natives of Pisa, Italy, learned the art and transported it to their own country.

Italian princes and noble families lent their patronage to the manufacture of majolica, among the patrons being the Medici. In the twelfth century the art was applied to tile-making, tiles replacing the more expensive mosaic work for floors.

In the sixteenth century pottery decoration was not considered beneath the notice of the greatest artists of the time. Raphael and other masters of the cinque-cento period made designs for pottery. In 1640 an Italian named Masso Finguerra discovered the art of copper-plate engraving by which designs could be readily transferred to pottery, and the art was greatly stimulated.

Italian artists who went to France in the time of Catherine de Medici took their knowledge of pottery making with them and established factories at Gien, Nevers, Rouen, Marseilles, Strasbourg, Moustier and other centers. In similar fashion the workmen of Holland learned the art, and the great factory of Delft was the result. In England the principal potters were included in the Staffordshire group, numbering such men as Spode, Davenport, Lilienthal and Wedgwood.

In addition to painted designs, two principal methods of decoration were followed—sgraffito and jeweled. The first was done by cutting lines into the biscuit or unglazed ware; the glaze ran thicker in these lines than on the surface, and the pattern was thereby produced in darker tracery. Jeweled ware is decorated with tiny bosses of enamel, little lumps of colored enamel being fused on the surface of the glaze. A third form of decoration, known as decoration en camaieu, is allied to the first method. The piece is adorned with low relief modeling, the glaze is applied, and since it runs thickest in the deepest hollows, these are correspondingly darker, producing a shaded effect.

The first scattered examples of porcelain to reach Europe came from Arab traders who received them from Chinese, trading to East Indian ports. In the early years of the sixteenth century, Portuguese Jesuits, returning from the Orient, brought examples of porcelain and also the secret of its composition. Before then the most extraordinary theories had been held. Porcelain was said to be made of lobster egg and oyster shells, fish scales and gypsum, buried for a century "to ripen." The returning missionaries were the first to explain that it was composed of the substances now known as kaolin and petunze.

European potters set to work to imitate the Oriental porcelain. Although they did not immediately discover kaolin or a satisfactory substitute, their persistent work was finally rewarded by the creation of a new ware, differing in some respects from the Oriental porcelain, but genuine porcelain, nevertheless.

The story that has grown up as to the discovery of kaolin in Europe is a picturesque one. According to this tale, a Saxon alchemist, Johan Fredrich Bottger, was accused of practicing the black art or magic and fled for protection to Augustus the Strong, elector of Saxony, who dwelt at Dresden. Under the protection of Augustus, Bottger continued his experiments, and in 1710 made the chance discovery of porcelain clay. The story is that he one day noticed the unusual weight of the powder with which his valet dressed his hair. Testing it, he found that it was a hitherto unknown variety of fine white clay, brought from Aue, near Schneeburg, in Saxony. He tried making vessels of the clay, and discovered that it was the long-sought ingredient of porcelain.

Augustus then founded the factory of Meissen on the Elbe, with Bottger as director. To guard the precious secret, the factory was made a veritable prison, with the workmen, sworn to the utmost secrecy, held under close guard and threatened with heavy penalties if they failed to keep silence regarding the new discovery. However, about 1720 a workman escaped to Vienna, told the secret of the manufacture, and the knowledge rapidly spread over Europe.

During the early years of the Meissen factory the designs were imitations of the Japanese. In 1731 Johann Joachim Kandler was appointed chief modeler, and began the designing of the artistic little groups known as Meissen or Dresden figures. Classical motifs were introduced later.

After the secret was told factories were opened in many other centers. At Berlin, for example, the factory opened in 1750 was under state patronage, and many laws were made to encourage the work. No Jew was permitted to obtain a marriage certificate unless he possessed a receipt for the purchase of a porcelain service.

The first porcelain factory in France was founded in 1673 at Rouen by Louis Poterat. Very few examples of the work of this factory are known. The first establishment on a commercial scale was founded at St. Cloud in the late years of the seventeenth century under the patronage of the Duc d'Orleans, and other factories soon followed.

Louis XV founded a private royal porcelain factory in 1745 at Vincennes, and in 1753 transferred his interest to Sevres, taking a third share of the works. The official title of "Manufacture Royale de Porcelaine de France" was then granted to the Sevres factory and a date-letter marking system was put in force—A for the year 1753, B for 1754, and so on to 1777, AA representing 1778. The system continued until 1793, when a less regular method was adopted. Up to 1792 the date letter was placed between two crossed L's for Louis,

as Louis XVI continued the system of his predecessor, but with the year of the republic the letter R was substituted. Later various monograms were used.

The first type of porcelain made at the Sevres factory was known as "pate tendre," or soft paste. Containing a smaller proportion of kaolin in its composition, soft paste is granular and chalky on broken surfaces and has less resistance to heat than hard paste, which is, as its name implies, harder. Pate tendre was made at Sevres up to the end of the eighteenth century, and pieces of this early period are rare and valuable. Recently its manufacture has been revived. Sevres porcelain is known for its creamy ground, soft glaze and delicate decoration, and fine pieces are very valuable. Napoleon is said to have sent to the King of Etruria a Sevres vase valued at $60,000. Jeweled Sevres was made after 1789.

Capo di Monte porcelain is an Italian ware, made at Naples in a factory established in 1742 under the patronage of Don Carlos, later of Spain. The most celebrated variety is decorated with figures in high relief, decorative in scheme and touched with red applied in the pointille manner to the less prominent parts of the relief to give warmth to the shadows. The designs of Capo di Monte porcelain are frequently taken from marine subjects—fish, sea shells, coral or sea weed.

Porcelain manufacture in England did not develop to any extent until about 1740 and received little royal patronage. Factories were established at Bow, Chelsea, Derby, Worcester and other places, and the Staffordshire potters added porcelain-making to their work. English porcelain was commonly decorated in heavy floral or pictorial designs.

Beleek is a particular type of ware made in Ireland, distinguished by an iridescent pale-colored glaze.

Porcelain in the Orient has followed its individual style, varying in color and design from the European ware. The early porcelain makers used simple metallic colorings, but often attained results that western artists have tried in vain to copy. Celadon and sang-de-boeuf are two characteristic Oriental colors. Celadon is a soft and very beautiful green, known in China for 1500 years, and due to the use of protoxide of iron. Sang-de-boeuf is a brilliant rich red for which copper salts are used. Both these colors are applied in the glaze.

The principal Chinese dynasties by which porcelain is dated are the Sung, 960-1279 A. D.; Yuan or Mongol, 1280-1367; Ming, 1367-1634; Manchu, 1634 until the founding of the republic.

Until the nineteenth century the kilns at King-te-chen, south of the Yang-tse river, which had been used for 900 years, were the porcelain center of the world. They were burnt during the Tai-ping rebellion

The popular blue and white decoration was probably learned by the Chinese from Western Asia. It appears in well-developed style in the fifteenth century, and the best period was from 1661 to 1722. The value of blue and white depends on the quality of the blue.

Most famous of the blue and white wares is hawthorn china, a beautiful and delicate design of tiny white flowers, shaped like an apple blossom, against a deep blue background, which represents the blue tone of ice. Hawthorn pieces of the best quality may run as high as $5000 in value.

Cantonese ware is another well-known type of Oriental china. The Cantonese artists discovered that by the addition of a minute quantity of gold to the metallic coloring they could obtain a beautiful rose pink,

an entirely new color. This type of ware is distinguished by elaboration of design, figures or flowers in panels, each panel making a picture and joined to the others by floral scroll work. Figures are prominently used, and the faces are worked out in detail. Colors are hard and brilliant, with the famille rose, or rose pink, predominating.

The increasing demand from the western world during the eighteenth and nineteenth centuries caused a decline in the quality of Oriental pottery and porcelain, which was turned out in quantity to supply the orders from Europe.

Japanese porcelain manufacture was not established as an industry until early in the sixteenth century. It quickly felt the influence of European demand, and never reached as high a point of perfection as the Chinese work.

A pair of enormous cloisonne lions, designed for the Imperial palace at Peking, stand guard over the gallery devoted to Oriental ceramics. These huge beasts were purchased by Mr. de Young from the Chinese commission to the Panama-Pacific Exposition, and are very valuable, as such fine specimens are now rarely made, and the size alone makes them out of the ordinary.

When he made the purchase Mr. de Young at first contemplated buying only one lion, but the Chinese delegates explained that they could not separate the pair, as they are always used together in China and a single animal would be of no use. The pair represents the male and female lion. The female, which stands facing the entrance door holds her baby securely pinned down under one large forefoot.

These animals are really as much dog as lion, as they are mythological creatures possessing the attributes of various species of terrestrial animals. In a slightly different pose, usually seated sideways with head turned, they are often known as Fo dogs, or Shishi. According to Buddhist legend, they have the rather Spartan habit of dropping their offspring over the edges of cliffs or waterfalls to test their vitality. A little Fo which survives this ordeal is assuredly entitled to wear the family expression of ferocity.

The two museum specimens are cloisonne on copper, with claws and teeth gilded. A bell of cloisonne hangs from the neck. The general design is a blue ground with decorations of gold and red in elaborate pattern. The lions are seated on teak pedestals over which are spread remarkably fine bronze imitations of drawn work, the metal wrought into delicate tracery and so fine that it seems to hang over the edge of the pedestal like fabric.

Cloisonne, usually associated with Oriental ceramics, but well known to European artists, is a process of enameling on metal, usually copper, or other materials. The design is outlined in fine gold wire, forming tiny fenced-off divisions into which the enamel powder is packed. The object is then fired to melt the enamel, and the process is repeated until the melted enamel fills the spaces. The surface is then polished and rubbed down. Cloisonne is said by some authorities to have originated in Ireland and to have spread through Byzantium to China. There are several remarkable specimens of ancient Irish work in cloisonne. Cloisonne on copper is called, in the Orient, Shippo-yaki; that on porcelain, Toki-shippo.

The particular pair of lions in the museum were made at the order of the late dowager Empress, Tsi An, to guard the door of the Imperial palace. Lions have been given the duty of guarding palaces and temples since the beginning of the Ming dynasty in 1367. Before that time unicorns, camels and golden horses were used.

Another remarkable example of Oriental work is the huge incense burner of hammered copper enameled with cloisonne. The burner is four-sided, with three removable upper sections, and stands on a teakwood base, with lion's paws for feet. It is about three feet high. A copper lion stands at the point of the cover, which is perforated in an intricate design. The burner was filled with charcoal and aromatic powder for the dual purpose of furnishing heat and scenting the rooms. A noteworthy feature of this piece is that the bronze panels with their elaborate perforated design are carved and not cast, as indicated by the rough edges showing the traces of the tools.

One of the unusual pieces given for this collection by Mr. de Young is the seven-foot-tall floor vase of cloisonne on copper. This vase is particularly interesting on account of the design of a conventional scroll and lilies, differing very widely from the usual Chinese work The lily design is called by the Chinese "Western Flower," indicating that it originated somewhere beyond China. Another name connects the pattern with Rome, and it is also called "Design of the Barbarians."

Around the lip of the vase is the Greek fret border, a design that came to China by way of India. The pattern also includes conventional bats, the Chinese symbol of happiness, and the flute, fan lotus, gourd, sword, clappers, flower basket and rattle sticks, borne by the Eight Immortals who have sway over the lives of men.

The vase was made for the imperial palace, and is a type of the huge floor vases that began to be used during the early years of the seventeenth century.

Another giant cloisonne vase, also the gift of Mr. de Young, has a copper base and silver trimmings. This specimen is Japanese and was made by S. Suzuki, one of the noted artists of that country. It is about seven feet high, with elaborate handles and an intricate design at the lip. The opposite sides are decorated with contrasting scenes, one showing a stormy sea with breaking waves and a ferocious dragon coiling in the cloudy sky, and the other a peaceful sea with a flight of birds and a large round moon. The designs are in gray and blue.

Two Japanese vases, standing about three feet high, are from the Awata factory, one of the principal porcelain establishments of Japan. The vases are decorated with an intricate gold and crimson design, noteworthy for the odd treatment of the figures in which the faces of porcelain are set into the elaborate background.

The wall cases contain hundreds of rare and valuable specimens of Oriental handiwork, Chinese, Japanese and the rare Korean. There are plates, cups, dishes, temple pieces, figure groups, tiles, and every conceivable form of pottery and porcelain work, representing all the best known wares and many of lesser importance.

Among the pieces are some excellent Satsuma examples, a ware which originated when the Prince of Satsuma invaded Korea and brought back as captives makers of the beautiful ware.

A rare piece is a Korean rice bowl about 500 years old of crackle ware. It was taken from a grave. Korean work is rare and valuable, as little of it was done in recent centuries, and the old pieces were destroyed.

Tiles taken from the ruins of the tombs of the first Ming Emperor of China date back to the late fourteenth century, when tiles were first made in China.

An odd variety of pottery is known as powdered tea ware from the use of powdered tea to give it its beautiful tone of soft grayish green.

It is a variety of stone china, made principally during the eighteenth century, and is very heavy and solid.

In the cases are several fine specimens of the valuable hawthorn ware with its blue ground and delicate white flowers. The museum collection of hawthorn, donated by Mr. de Young, has been given high praise by Sir Paul Chester of Hongkong, who is the owner of the best collection of hawthorn known.

Modeling figures, singly or in groups, occupied the attention of many Oriental potters and porcelain makers. Temple pieces include statuettes of gods and goddesses of many characteristics, as well as allegorical figures and decorative pieces. Geisha girls, dancers, athletes and children were favorite models for the potters, and historical groups were frequently made. All these classes are represented in the museum collection, which is unusually large and complete.

The familiar Sleeping Cat of Nikko is not forgotten, the exceedingly sound asleep cat which in the western world frequently serves as a door-stop. The original of this cat was carved in wood by Jingoro, a famous wood-carver of the sixteenth century.

A remarkable collection, gathered by Claxton, a pottery enthusiast, and purchased and donated by Mr. de Young, is the display of tea caddies and bowls that fills one large case. There are 32 caddies and 36 bowls in the collection, each in its silk case, and each of distinctive beauty.

The Japanese tea ceremony is a cult which has existed since the sixteenth century when knowledge of the tea ritual was brought to Japan by a Buddhist priest who had visited China. Elaborate ceremony surrounds the drinking of tea in the Orient, and the most detailed rules are laid down for observance. Tea bowls are treasured as family heirlooms, and Oriental makers put their best efforts into the manufacture of these objects. Each tea jar is individually designed.

Some of the bowls in this collection have been made for the use of royalty, as is indicated by a gold inlay along the rim of the bowl, placed there that the royal lips might not be forced to touch common clay. An idea of the value of the collection may be gained from the fact that a collector once made an offer of $5000 for a single specimen.

Another unusual collection is Mr. de Young's display of ginger jars. The jars are in various wares, blue and white and in other colors, and, like the tea bowls, are individual in design. They have covers of teakwood in pierced designs, and are particularly beautiful for their simple, strong proportions.

The collection of Sevres is particularly good, especially the display of cups and plates of the Napoleonic period, which bear portraits of Napoleon, Marie Louise, Josephine and other men and women of the day. Unfortunately the disaster of 1906 broke a number of the plates, but several survived.

Three wonderful Sevres pieces are housed in a special case. They include an oval bowl on a standard of gilt filigree, decorated with a Watteau panel and an elaborate filigree gilded lip and handles, supplemented by a pair of vases in the same design with etched bronze ornaments.

An interesting Dresden set, which is remarkably complete, is one which was made for Ludwig II of Bavaria, known as the Mad King and the ruler whose palace is reproduced in the Royal Bavarian rooms of the museum. This set has scenes from "Lohengrin" painted on a blue background with a gold and white border.

Another beautiful Dresden piece is a cabinet of ebony inlaid with porcelain panels in Watteau style, solid columns of porcelain at the corners, and elaborate gilt decoration.

The four famous Vases of the Elements which stand in the Porcelain Museum at Dresden are reproduced in examples in the Memorial Museum. These vases, which are about two and a half feet high, represent Fire, Air, Earth and Water, and are decorated with many symbolical figures.

The little Dresden or Meissen groups of figures are notable for their extreme delicacy, the lace and silk patterns of the costumes being exactly reproduced.

A large and conspicuous piece is not European but Indian, a great vase in brilliant yellow and blue with curiously crude designs and strange animals serving as handles.

One very beautiful and valuable piece is the famous Doulton vase which was made by the Doulton factory in England for the Columbian Exposition at Chicago in 1893, and which was there purchased by Mr. de Young. The panels of the vase, painted by Piper, are in remarkably beautiful fruit and flower designs, notable for the smoothness and delicacy of the color. Diana and a wolfhound stand on the top of the cover, and the ivory tone of the groundwork is exceptionally fine. The vase is said to be the best example of Doulton work known and is valued at $1200.

Another remarkable piece which was also made for the Columbia Exposition and bought by Mr. de Young for the Museum, is a Royal Worcester vase, said to be the finest piece of Royal Worcester in existence. Its cameo-like delicacy of design is marvelous. There is also a splendid piece of jeweled Royal Worcester in another case.

The collection of majolica is unusually representative. Majolica is distinguished from other wares by its decoration rather than by shape or method of manufacture. The Italian potters of Tuscany in the sixteenth century imitated the Spanish ware, brought to that country by the Moors, and developed a brilliant luster decoration that makes pieces of the sixteenth and seventeenth centuries especially valuable. Single pieces of this period sometimes bring as much as $10,000. Rivalry among the majolica makers was keen, and the towns of Faenza, Savona, Gubbio, Cafaggiola and Deruta sought each to put forward the best pieces.

The modern Italian potters are resuming the making of majolica after the sixteenth century designs, and most of the museum pieces are reproductions of antique originals from the Cantagalli establishment at Florence. Among them are a covered jar and a large vase in Savona style in blue and white; a Deruta vase with decoration in Spanish colors in Raffaelesque style, the Spanish influence being especially marked in Deruta; a Venetian vase in green and blue, and a particularly interesting Venetian vase, the Persian design of which shows the influence of Venetian trade with the Levant.

Majolica plaques, both Italian and Spanish, show another application of the art.

Some very interesting pieces are Talavera ware, Spanish and Mexican. The first ware of this type was made at Talavera-la-Reyna, in the interior of Spain, and the art was taken to Mexico by Spaniards of the seventeenth century. The natives of the state of Jalisco, Mexico, learned to make the ware, and developed a most interesting combination of Spanish and native art, the designs showing distinct traces of

their Aztec ancestry. The designs are done in bold black on vermilion or other solid colors.

A case of blue and white ware offers an opportunity to compare the styles of the different potters. The Staffordshire group is well represented, and there are also examples of Delft and Willow ware. One Staffordshire platter in this case has a unique history. It was found in the ruins of a convent and church at Mauqina, Philippine Islands, and bears the stamp of an English maker of the eighteenth century.

The Wedgwood display includes many excellent reproductions of the remarkable collection of originals in the South Kensington Museum, London. The Wedgwoods were an old Staffordshire family, and John Wedgwood (1654-1705) was a potter as early as the seventeenth century. He was the great-uncle of Josiah Wedgwood, who in the next century founded the famous factory. Only one piece signed by John Wedgwood is known to exist, a three-spouted puzzle jug in the Jermyn Street Museum of Geology in London. Wedgwood's characteristic output was plaques and vessels, delicately tinted in blue, green or brown, with minute cameo reliefs in white paste, applied while the clay base was soft and fixed by firing. The favorite models, especially for plaques and vases, were classical, and many antiques were copied. Such examples as the Thorvaldsen plaques are typical. Reproductions of these are included in the museum collection, as well as many vases, bowls and pitchers.

The glassware collection forms an exhibit by itself. The making of glass is an ancient industry. Tombs of the Egyptians of the fourth and fifth dynasties (4000 B. C. et seq.) show glassblowers at work. Tyre and Sidon were centers of the glass industry of the ancient world. Sidon is credited with the invention of mirrors.

Although Assyria and Babylon were known for glass-making, little was done in Greece. Glassware in Rome was very popular and cheap. Ancient writers mention the small prices for which objects of glass were sold.

Byzantium (Constantinople) was the great source of glass until the rise of the Venetian industry. Workmen fleeing from Constantinople after its fall in 1204 came to Venice and set up their factories, making glass for mosaics and also articles of glass. The thirteenth and fourteenth centuries saw the industry at its height. The Venetian Council of Ten made rigid rules for the protection of the industry. Artists were forbidden to leave, and a story is told of one who escaped, only to be followed to Normandy and stabbed with a dagger inscribed "Traitor."

In 1291, fearing the danger of fire, the Venetian authorities ordered the glass furnaces to be removed to the island of Murano, near the city, and here the glass-makers formed their own republic. Glass-making was an honored occupation. Noblemen married their daughters to glassworkers, and their children were regarded as members of the nobility.

By 1495 the shops of the glassworkers on Murano formed a street a mile long, lined on either side with little shops, as the tendency was toward small furnaces with a few workmen at each rather than large establishments. Articles of glass were made by individual designs. Glass vases and cups were used for gifts to royalty, replacing gold.

Various types of decoration were developed by the Venetian glassworkers. Among them were "millefiore," a mosaic of white threads in a blue or colored ground; "vitro de trine," twisted rods of opaque

white in clear glass; "latticelli," a lacelike network. Many improvements on the rediscovered lost art of the ancient glass blowers were made by the Venetian workmen. About 1300 they discovered the process of covering plates of glass with amalgam of tin and mercury, and improved on the older style of mirrors. Marco Polo persuaded the Venetian glass-makers to make beads for the African and Asiatic trade, and the Venetian product was thus distributed throughout the known world.

At the beginning of the seventeenth century the Murano colony included more than 300 workmen. After that the decline was rapid, and by the beginning of the nineteenth century the colony was reduced to one factory. Recently efforts have been made to revive the industry, and more factories have been erected.

The Venetians specialized in glass novelties. The glass they made was very soft and malleable and could be formed into delicate shapes. Elaborate pieces were sometimes reheated fifty times before they were finished.

Bohemian glass, made by German and Hungarian workmen, is stronger in color and bolder in outline than the Venetian variety. Ruby glass, colored with copper or gold, was invented in the seventeenth century by a Prussian named Kmeckel, and the new color became popular for this type of work.

France and England also made glass, although not to the extent of Italy's work. English crystal is particularly beautiful. A glass factory is said to have existed at Poitiers in France in Roman times

France and Germany are rival claimants for the invention of stained-glass windows. Painted glass windows at Limoges are said to date back to 800 A. D., and the abbey of Tegernsee in Bavaria has stained windows which are said to be equally old.

The glass collection in the Memorial Museum includes both originals and reproductions of the earlier and rarer Venetian pieces; Carlsbad glass, French work, English crystal, Bohemian glass and other types, showing all styles of design, from the beautiful simplicity of Venetian goblets and bowls to the ornate and heavy patterns of German pieces.

The Oriental Gallery

Temple Bronzes—Buddhas—Figures—Lacquer Work—Great Bronze Lanterns—Temple Bells—Cloisonne—Incense Burners—Models of Pagodas—Samurai Swords—Embroidery—Netsukes—Ivory and Wood Carvings—Life-sized Figures.

With the artistic wealth of the Orient almost at the doors of San Francisco it is not surprising that the Oriental gallery of the Memorial Museum houses one of the largest, most representative and most valuable collections in the entire building. Filled with rare treasures from across the Pacific, the gallery is also a splendid example of effective installation. Every article, from the giant temple bronzes to the tiniest ivory netsuke, is displayed to the fullest advantage, and the various classes of exhibits are so grouped that interesting comparisons are possible.

One side of the gallery, between two entrance doors, is given over to a massive temple installation, a gilt and crimson shrine with elaborately embroidered hangings, a huge gilt Buddha and other accessories, smaller Buddha figures, images of other gods, temple bells, temple furnishings and similar articles. The center of the gallery is occupied by several large glass cases containing special collections, such as the valuable array of netsukes and inros, ivory carvings, lacquered articles, and so on. About the walls are other cases, filled with bronzes, examples of lacquer work, carvings, figures of gods and goddesses, and a thousand and one articles of beauty and value.

Directly in front of the main entrance door is a magnificent example of bronze casting, an enormous bronze urn or "non," to give it its Japanese name. This huge urn has a diameter of three and one-half feet, and weighs about one-fifth of a ton. It was made during the latter half of the nineteenth century at the order of an Osaka temple, and is an absolutely perfect specimen of bronze casting. The clear bell-like tone that is awakened if the urn is sharply tapped could not be produced if there were a flaw in the metal.

In design the urn is splendidly simple, wide and low, rising in beautiful curves to the rounded shoulders, which are adorned with a line of small round bosses, the only ornamentation on the bowl.

Standing in the center of the gallery are two giant bronze lanterns, nearly ten feet tall, from the Temple of Nan-Ko-San, Kobe. These lanterns are elaborately designed with dragons curling about the standards, intricate open-work patterns in the sides, and the typical upcurving lines of the covers. Hung about the lanterns are small bronze bells, and the legend goes that when these bells were rung by devotees, the god Butsu heard prayers offered to him. The lanterns are especially beautiful for their light green patina or finish.

Another antique temple piece of bronze is the bell that rests on its teakwood pedestal in the center of the room. The inscription in ancient Japanese characters is translated to read: "Made in the second month of the year of the cock for the Buddhist temple of O-to-ku-ji." The second month of the year of the cock is to be interpreted as March 11 to April 18, 1785, and the temple of O-to-ku-ji is the present monastery of Fuku-ju-san.

The principal treasures in bronze of this collection are found in the wall cases. Hundreds of pieces are gathered here, vases, bowls, sword guards, charcoal burners, ornamental pieces, mirrors, incense burners and many other articles. Some of the bronzes are decorated with enamel inlay, and both Chinese and Japanese work of all periods is represented.

In a case to the right of the entrance door, as the visitor comes from the Statuary Hall, stands one of the most remarkable vases of the collection. This magnificent specimen of bronze work was made by Tsunheiro, a famous artist of the eighteenth century. It is a vase of classic form, decorated, in low relief, with representations of all types of vases made by Oriental artists, enamel, cloisonne, iron, bronze and other materials. The different types of vases are accurately imitated in the bronze surface, giving a perfect reproduction of the rough iron vessels, the smoother bronze, the highly finished enamel or cloisonne surfaces, and so on. The grouping of the vases about the sides of the parent vase is a beautiful example of still life composition.

A rare piece in this same case is a Korean charcoal burner of copper with brass overlay. It is interesting largely because of its rarity, for Korean houses are usually heated with small stoves, and burners of this type are seldom found. The burner is a large bowl, about twenty inches in diameter and twelve inches deep, with brass handles at the sides. About the top is an overlay of brass in the teardrop design, a pattern of squares not unlike the familiar Walls of Troy. When used as a charcoal burner, the bowl was filled with sand and an iron firebox filled with burning charcoal half buried in the sand, which kept the heat from reaching the outside bowl.

Another antique firebox or hibachi is of hammered iron, decorated in conventional dragons. This particular box is about 100 years old, and was designed and made by Miochin, one of the most famous ironworkers of Japan, during the late eighteenth and early nineteenth centuries.

Allied to the charcoal burners are the bronze incense burners or koro. These small boxes, usually set on four legs with a somewhat rounded body and a perforated lid, are familiar to the Occident through the many modern examples found in every Oriental store. They were filled with sand, and the incense either scattered on the sand or, if in stick form, thrust through the holes in the lid.

One beautiful specimen of antique incense burner is of Ise bronze with a dragon design on the lid. Ise prefecture is known as the "holy land of old Japan," where Shintoism has had its stronghold. Bronze workers were particularly numerous there, and the Ise work is regarded as the best Japanese type.

A curious example of bronze casting in this case is the leaping carp, a large metal fish, so cunningly shaped that it stands balanced almost literally on its tail.

Carp, so frequently found in Japanese art from their association with religious beliefs, are also used in the decoration of a large and beautiful urn of bronze. Darting fish swim about the sides of the urn, remarkable in the accuracy of the difficult perspective. The design was made by hammering from the inside of the urn, bringing the carp into sharp relief. The urn, which is some three feet in diameter, is about 100 years old, and its age has given it a beautiful patina of full green and copper red.

Interesting objects in the case of bronzes are the Shinto mirrors. Shintoism, which is regarded as the national religion of Japan, is notable for the ascetic severity of its temples and the absence of idols. In the place of the usual images and elaborate decorations of a Buddhist shrine, a Shinto temple contains on its altars, the mirror, the crystal ball and the sword, emblems of the faith. The mirror was used to remind the maker of prayers, gazing upon it, that his sins are seen as he sees his face in the mirror, in which disguises are penetrated. Writers on Japanese subjects state that in former days a sword was buried with a man and a mirror with a woman, since these articles were held peculiarly symbolical of the sexes. The Shinto mirrors in the museum are small round affairs of copper and bronze, held upright by a short standard, which is usually carved or modeled.

A bronze model of a pagoda occupies one corner of a case. The pagoda, formerly built as a shrine over relics of saints, is now often erected in the Orient by individuals who wish to "acquire merit" by the deed, just as chapels are given by members of other faiths. The pagoda thereby takes on something of the nature of a family shrine or memorial. It is invariably built with an odd number of stories.

A collection of unusual interest and value is the display of sword guards or tsuba, small discs of bronze, elaborately carved or chased, with a slit for the sword. These were used by the samurai of old Japan, and one of these two-sword warriors would usually own a large number of tsuba, so that he might vary the appearance of his costume day by day, as the modern man varies his tie pins. Tsuba went out of use in 1876 when Prime Minister Sanjo signed the decree forbidding the wearing of swords. Millions of the attractive little metal articles came into trade and found their way into collections.

The typical tsuba is of iron or bronze, heavily hammered and usually in open-work design.

The general collection of bronzes contains a large number of interesting and beautiful vases, boxes, trays, swords, ornaments and many other articles. A considerable number of the bronzes given by Mr. de Young were purchased at the Deardorf sale some years ago, and represent the best of the early Meiji era, when a new freedom in art and ideals brought about a renaissance in Japanese art.

About the walls of the Oriental room hang some beautiful examples of Japanese and Chinese embroidery and painting, several excellent kakemonos or wall panels, embroidered pictures, hangings and similar objects. Screens of lacquer and wood illustrate another form of Oriental art. Some of these screens are very old, notably a three-panel screen or Coromandel lacquer of the Kang Hsi period (1662-1722) and a four-panel screen of the Chien Lung period (1736-1795).

A collection that repays careful study is the remarkable display of netsuke, collected and donated by Ney Wolfskill, who also gave the special cases in which the exhibit is displayed.

The netsuke is distinctively Japanese, and is designed for purposes of utility as well as adornment. It has taken the place of jewelry for the men of Japan—women do not wear netsuke—as Japan is unique among nations in that her people have never worn jewels or precious metals for ornament.

The Western equivalent of the netsuke is the watch fob. A Japanese, wearing his native garment without the convenience of pockets, thrusts into his girdle his purse, his tobacco pouch and pipe, his portable writing materials or anything else he desires to carry. To keep the articles from slipping through, he fastens a cord to them, and at the other end of the cord ties a netsuke. Netsuke are to be distinguished from other small carvings by the two little holes in the back through which the cord has been passed.

Wood and ivory are the usual materials of which netsuke are made, although any durable material may be found. The earlier pieces —seventeenth century—are usually of wood, and the later periods incline to ivory.

The average height of a netsuke—or the diameter of those in flat circular form—is two inches. In this tiny space the Japanese artist creates the most intricate designs, in the majority of cases illustrating some legend or folklore tale, usually comic or flippant. The minute detail of the carvings is amazing; in the two-inch space the artist often places several figures of men or animals, each distinctive, each perfectly carved, each possessing its own individual humor. Every netsuke is a separate design; in the museum collection of 780 specimens there are no duplicates, even though several of the netsuke may depict the same theme.

Animals and birds are very popular among the makers of netsuke. One finds in this collection monkeys, rats, dogs, badgers, frogs, foxes, chickens, pheasants, cats, rabbits, boars, goats, bulls, tigers, deer, turtles, spiders, sparrows, snakes and many other living creatures. The wealth of legend with which the Japanese surround various animals furnishes material for many designs. The fox, for example, is the rather mischievous deity of the rice fields, who, at the age of 50 years, may take the form of a woman, at the age of 100 the form of a young girl, and at the venerable age of 1000 faces the delightful prospect of being admitted to heaven and becoming a celestial fox with nine tails. Rats were assigned the task of waiting upon Daikoku, the god of wealth, and gnawing his rice bags to enforce the lesson that wealth, once acquired, must be guarded. Many legends refer to the badger, the raccoon and the dog, and monkeys figure in a vast array of folklore.

Other popular figures deal with the legendary spirits and imps of Japanese belief. Most frequently seen are figures of "Oni" or evil spirits, who, in their lighter moments, indulge in more or less harmless mischief. Fortunately the Oni have a horror of roasted black beans, and the New Year's ceremony of casting this variety of bean about the house serves to clear the place of the imps, for the time being, at least. One of the netsuke portrays this ceremony, and others show Oni at their pranks.

The principal foe of the Oni was Shoki, or demon destroyer. Legend relates that he was a student who committed suicide in chagrin at his scholastic failure, but, by special order of the emperor, was buried with high honors. His spirit, in gratitude, sought ever after to battle the demons who infested the country and who were no respecters of persons, swarming as thickly in royal palaces as

in humble homes. Shoki carries a double-edged sword and a large hat, which is most convenient for the purposes of trapping Oni. Several of the netsuke show Shoki with a squirming Oni caught under the useful hat.

In addition to these legendary subjects, the events of daily life furnish a multitude of subjects. Children at play, wrestlers in combat, strolling actors, musicians, workmen at their tasks, dancers, women at household duties and similar scenes are shown. Often animals are pictured assuming the roles of men with humorous effect. Netsuke of simpler conception are designed to represent flowers, fruit, masks or conventional designs.

Inlays of metal—gold, silver, copper or bronze—lacquer, jade, agate or contrasting varieties of ivory or wood are used to adorn the netsuke.

The entire display represents thirty years of collecting and is valued at $75,000.

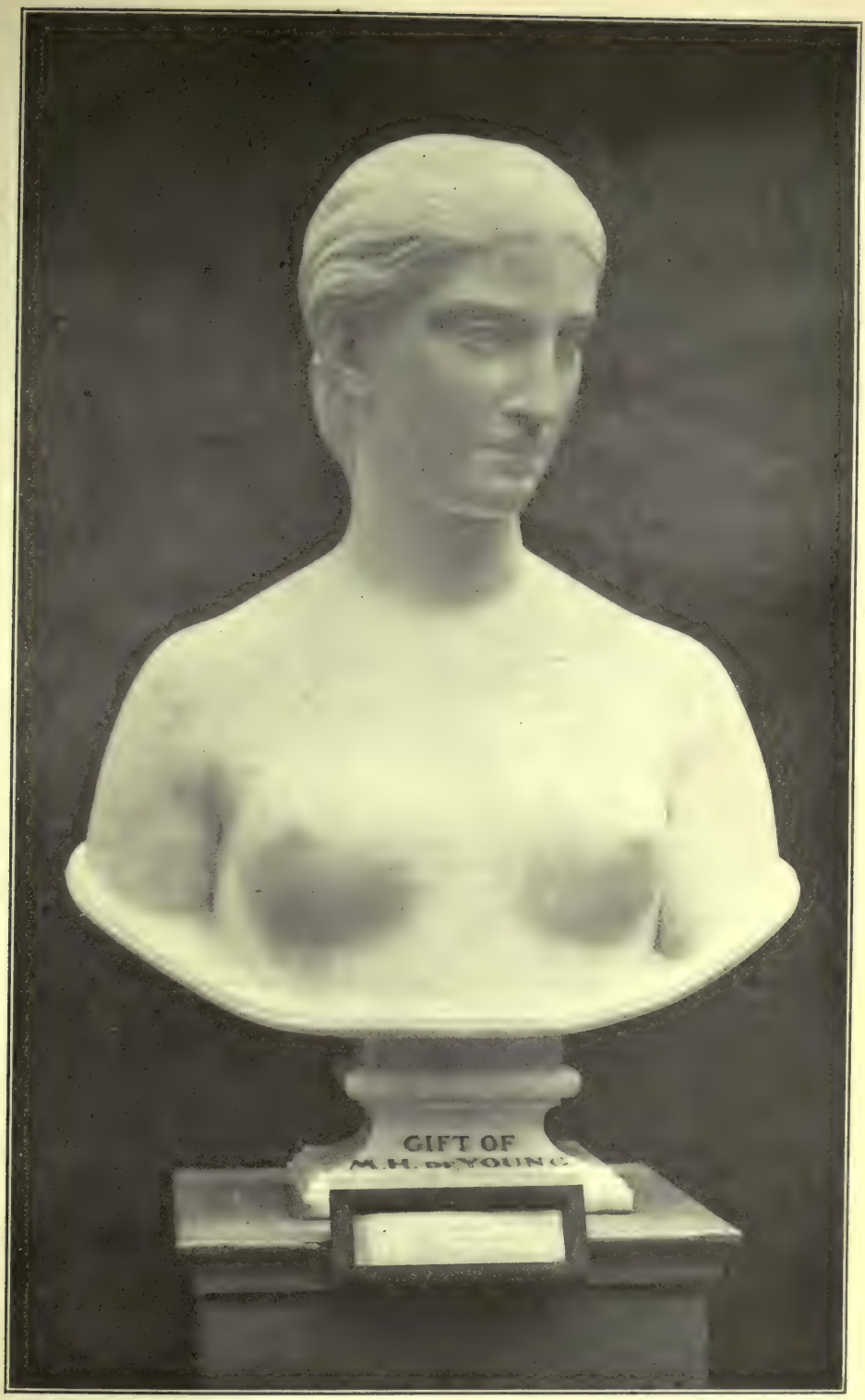
Another collection of great value is the Walter Heyneman case of inros or purses. These beautiful specimens of Oriental work are in lacquer, metal, ivory and other materials, showing all types of work and varying designs. In the collection of eighty-seven specimens, there are no duplicates, and each inro is an individual study. The art of ivory carving, splendidly illustrated by the collection in the Oriental gallery, as well as ivories in other galleries of the museum, is one of the oldest forms of artistic expression. The prehistoric man who discovered that he could scratch rude pictures on the tooth of the mammoth or the tusk of the sabre-toothed tiger he had slain, was beginning the art developed to the height of its perfection by the patient craftsmen of the East. After the man of these dim ages came men who learned how to shape the easily handled ivory; gradually the art grew until it is practiced in every part of the world where ivory is obtainable.

True ivory is the tusk of the elephant. Inferior qualities include the tusks of the walrus or narwhal, used by the Alaskan Indians. The best ivory comes from Africa, and the best quality of African ivory is found near the equator. It is closer in the grain and has less tendency to turn yellow than the Indian ivory.

Japanese ivory carving, like her other arts, has shown signs of deterioration since the coming of Western trade. With the tremendously increased demand and the pressure on the workers, the output, while larger, is of inferior quality, and fine pieces are steadily growing in rarity and value.

The first Japanese ivory carving was done for temples and for religious uses. In the seventeenth century an edict was issued commanding every householder to equip his home with at least one image of a deity. Ivory being a popular material for these images, the work of the carvers was greatly stimulated for a time, until the supply began to equal the demand—an ivory image lasting for many lifetimes—when the carvers turned their attention to other articles, notably netsuke or purse guards.

The Memorial Museum, in its Oriental gallery, displays a fine collection of Oriental ivories, notable both for number and for quality. In addition to the ivory netsuke in the Wolfskill collection, there are many cases full of beautiful carvings of all types and sizes. Several collections, donated as such, have made this growth of this division of the exhibit very rapid.



Marble bust entitled "California." Executed by Hiram Powers, one of America's greatest sculptors. Statuary Hall.

One of the remarkable pieces of carving is the sword with ivory, sheath and handle, the blade having been forged by the famous Japanese armorer, Munechika, 986 A. D. The sheath of this magnificent example is carved with figures of Rakans or disciples of Buddha, and so delicate is the workmanship that the separate hairs of eyebrows of these figures stand out distinctly.

Another splendid sword and sheath measures sixty-three inches in length, every inch of the sheath elaborately carved.

Carving in wood has long been an art in which the Oriental craftsmen were proficient. Larger figures were made of this material, including many images of deities and temple figures. A favorite type of image was carved of wood and elaborately gilded. Many of the idols in the museum collection are of this class.

A very old example of Japanese wood carving is the quaint little figure of General Minamoto Yoshimoto, hero of the battle of Hiyodon, fought some thousand years ago. The general, in full panoply of battle, red lacquered armor, helmet, sword and spear, is mounted on a remarkable horse, also equipped with suitable protection. The armor shows the characteristic heavy shoulder plates and curious square design of ancient Oriental styles.

Many examples of carving are found in the collection of temple property, including images of deities, articles used in the temple ceremonies, etc. The huge gilt shrine which fills one side of the gallery was brought from China during Boxer times, when so much of the ancient treasure of the country was "acquired" by the foreign visitors. On the ledges of the shrine stand many figures of Buddha and other divinities in woodcarving, ivory, stoneware, bronze, lacquer and other materials.

A remarkable object is the three-panel screen which once formed a portion of the doors of the inner temple at Tokyo. The screen is lacquered over gold, and was made at a period when gold was valued only for its color. The panels are of delicate latticework, beautifully lacquered.

In front of this screen stands a terrifying creature—Yemma, king of Hades. According to Japanese lore, Yemma is the dread judge who apportions to mankind, after death, reward or punishment for good or evil deeds on earth, dispatching them to Paradise or Hades, his own particular kingdom, according to their merits. He is said to possess a huge mirror in which the thoughts and acts of men are reflected, and also a book in which he enters punishment given to offenders. With his long drooping mustaches and bristling eyebrows, his fearful scowl and his hideous mouth, Yemma is enough to terrify the most hardened wrongdoer.

An interesting piece of wood carving occupies the center of the case devoted to this form of art. It is a symbolical carving of camphor wood, representing the twelve animals corresponding to the constellations of the zodiac. These animals, the rat, bull, tiger, hare, dragon, snake, horse, sheep, dog, boar, monkey and rooster, are shown climbing over each other in a most intricate arrangement, with the topmost pair supporting a globe on which are inscriptions. These animal symbols are used in Oriental astronomy to indicate time, directions, years and dates. The day and night are divided into twelve instead of twenty-four-hour periods, beginning with the "hour of the rat" at midnight. The carving in the museum was done at Osaka in the latter part of the eighteenth century.

Other wood carvings in this case include figure studies, conventional groups, animals and other subjects.

The museum collection of lacquer is one of the most valuable and complete in the entire display. This peculiarly Oriental art is represented by hundreds of pieces of all types, illustrating the best work of the Chinese and Japanese artists.

The Chinese were the originators of the art, the Japanese learning it from them in the beginning of the sixth century and rapidly surpassing their teachers. The earliest examples of lacquer work are plain black. About the eighth century, gold dust began to be used to relieve the black, and between the ninth and twelfth century the Oriental artists learned the use of gold leaf and bits of mother-of-pearl as additional decoration. Formal designs were usually employed in the early pieces; decoration in relief was introduced during the fifteenth century, and at the end of the seventeenth century saw the art of lacquering at its height.

"Lac," which is the principal material used in lacquer work, is a thin gum taken from the trunk of a tree, strained and the water removed, and coloring added. The Oriental workman shapes the object to be lacquered of wood, usually of white pine. It is covered first with a layer of very thin Japanese cloth or paper, to prevent warping, and then sized and lacquered. Successive coats of lacquer are applied, dried and rubbed down, and finally given the smooth and highly polished surface of the background. The object is then turned over to the artist, who takes the tray or box with its plain, adorned surface of black lacquer, sketches the outline of his design with white lead, fills in the design with colors or gold, and covers the whole with a coat of translucent lacquer, minus the usual coloring matter. The fine gold spattered effect characteristic of many pieces is accomplished at an earlier stage by sprinkling the object with gold dust.

Cinnabar lacquer is a special type, the beautiful red shade being attained by adding cinnabar coloring to the original lac. Objects decorated with cinnabar lacquer customarily have no other adornment, the color and carving serving as the only decoration. Cinnabar lacquer is frequently used for furniture, and the museum contains several specimens of this work.

Lacquer workers must take every precaution to keep their work free from dust and the touch of foreign objects that would destroy the smooth surface. For this reason they often work on board boats moored in the rivers, to avoid the danger of dust settling on their work while the lac is still moist.

The principal lacquer collections in the Oriental gallery are those given by Mr. de Young and Walter Heynemann. Mr. de Young's collection includes a quantity of valuable and beautiful pieces, such as boxes and caskets of all descriptions, trays, tiny screens, worship bells carried by women on their way to the temple, articles of daily use, boxes for holding the materials to blacken the teeth of married women, thereby presumably rendering them unattractive in the eyes of all save their husbands; the characteristic low tables of the Japanese household, ornaments, and a hundred other objects. Both Japanese and Chinese work is represented.

The Heynemann collection also covers a wide variety of objects in all the different types of lacquer.

One writing table of black and gold lacquer was presented by Mutsuhito, Mikado of Japan, to Charles E. de Long, American Minis-

ter to Japan in 1873, and the first white man to be received in audience by the Mikado after Perry made his historic visit. Red lacquer screens 350 years old, antique trays and boxes, and many other beautiful specimens are included.

The designs on lacquered work are always notable for their delicacy and beauty, particularly the gold tracery on the black backgrounds, often with a drift of gold dust bringing out the full effect. One unusual use of gold and lacquer is the inlay of small bits of gold leaf at close intervals in a bed of lacquer. Japanese artists declare that this form of decoration requires a higher degree of skill than any other type of lacquer work.

Hundreds of miscellaneous articles of Oriental origin are gathered in this gallery, where hours can easily be passed in detailed study of the many forms of Oriental art.

An exihibit that invariably attracts the closest attention is the example of Japanese modeling that was donated to the museum by the Japanese commission to the Panama-Pacific Exposition. Seated in a glass case is the life-size figure of a man, modeled with absolute fidelity to nature. He is in a crouching position, hands hanging between his knees, and his head tilted slightly back. In anatomical detail, texture of the skin, veining of the hands, the finger nails, the eyeballs, even in the manner in which the hair apparently grows from the scalp, the figure is a marvelous example of modeling. It is not at all an uncommon occurrence for juvenile visitors to the Oriental gallery to refuse flatly to believe that the coolie is not alive, and so lifelike is the work that it is not difficult, even for older visitors, to imagine that a quick glance would catch him in motion.

Another lifesize figure portrays a Japanese coolie drawing a jinriksha, a reminiscence of the Midwinter Fair.

Over one of the doors is a large model of a Chinese theater, brilliant with gilt and crimson and holding the richly costumed figures of Chinese actors.

A unique exhibit is the model of the residence of Soichiro Asano, president of the Toyo Kisen Kaisha, included to show a typical home of a wealthy Japanese.

The Arms and Armor Gallery

A Collection That Illustrates the History of Warfare—Types of Weapons of All Times—Specimens of Guns and Other Devices Employed in the Great War—Aeroplane, Field and Other Guns—Armor of Mounted Knights, and Foot Men—Oriental Armor—Posters and Other War Relics—Weapons of Primitive Man.

The history of warfare is set forth in the splendid collection that is housed in the main central hall of the unit, a hall so large that the German battle plane that forms its most conspicuous exhibit has plenty of room to spread its wings, and yet a collection so great in scope that every available inch of the big gallery is pressed into service.

The European war was the source of a vast quantity of the exhibits. Mr. de Young presented an extremely valuable assortment of war relics, and the museum was also fortunate in obtaining the great number of objects brought back from Europe by Congressman Julius Kahn and Morris Hertzstein of San Francisco, a collection gathered during a tour of the battle fronts as members of an official party. Many other donors have added their gifts to the war collection, making a display so complete that it is difficult to think of any object which is not represented.

Wars of former years are illustrated by collections of relics of the Spanish-American war, the Boxer uprising, the Civil War, Philippine insurrections and other struggles. Still older conflicts are represented in the collections of armor, old-time weapons, war materials from all parts of the world, native spears, shields, swords and similar weapons; a complete display of guns, rifles, muskets and small arms; cases of swords, daggers and strange Oriental knives; scores of spears, lances and darts in every conceivable shape and size; field artillery, modern and of older type; and a great quantity of articles of individual historical interest.

The military display has been very excellently installed, the larger objects, such as field guns, ammunition carriages, the German plane and so on, arranged in interesting groups on the floor, and the case material classified by periods. Individual cases are devoted to the display of types of weapons, swords, pistols, daggers, Oriental knives, etc. Overhead, from the crossbeams of the hall, hang a number of historic flags, American and foreign, and other flags are placed over the cases.

Very effective displays of shields, spears and lances are arranged above the wall cases, classified as to type and geographical origin. Curiously shaped mediaeval battle axes and spears radiate from shields used by knights of the Middle Ages; vicious-looking Oriental darts surround odd shields of straw, shark skin or rhinoceros hide.

The German battle plane that is suspended in the center of the hall is a grim relic of warfare. Great gaping holes in the fuselage, the wings and the engine, broken struts and wires and bent wheels are suggestions of its last flight, when it was brought down by allied fighters. The lower faces of the wings are camouflaged with a checkerboard of various colors, designed to make the plane difficult to see against the sky. Huge iron crosses are painted on the wings and fuselage, and the side of the machine bears the word "Stropp." The particular form of decoration carried on the nose of the plane indicates that its aviator was a flyer of note, presumably a German ace.

A curious bit of history attaches to the plane in the fact that its engine is stamped with a guarantee, warranting it for service until July 28, 1918. It was just about this date that the Germans, halted at Chateau-Thierry by American troops, began their last retreat.

Beneath the plane stands another relic of modern warfare, a two-man tank. It is also a trophy captured from the Germans, and bears the scars of its final battle, when a shell went through the radiator and exploded in the gasoline tank, killing both members of the crew. The tank has steel armor an inch thick, weighs six tons and is equipped with a rapid-fire gun, still in place in the tower. It is such a ponderous affair that when it was delivered at the museum, brought there on a seven-ton Army truck, a four-inch hawser was snapped like a thread in the effort to haul the tank down the runways.

Surrounding the plane and the tank are several pieces of field artillery from the recent war. Included in the collection are several of the famous French seventy-fives, captured German guns, American artillery, field mortars, machine guns, light artillery and heavier pieces of all types.

The artillery collection is completed by several most interesting historical specimens. Among them are two cannon used by Wallenstein's army during the Thirty Years War. These guns of the seventeenth century have bronze barrels and wooden carriages, and appear clumsy and slow of action, compared to the modern pieces. Another cannon of historical interest is a ship's gun from the famous British ship Bounty, which figured in a thrilling tale of mutiny and piracy, and was burned by pirates and mutineers at Bounty bay, Pitcairn island, in 1790.

Several old Spanish pieces are included, among them a bronze mortar captured after the battle of Manila, which bears an inscription dating its manufacture to 1780 in the foundries of Peru. Another pair of ancient Spanish cannon may be found at the entrance to the 1917 unit of the museum, guarding the doors. These two bronze cannon, which possess an irresistible lure for every child who visits the museum and promptly climbs on the old guns, were captured by Admiral George Dewey from the Spaniards at Manila. They are elaborately decorated with the arms of Carlos IV of Spain and bear lengthy inscriptions in Spanish. Each gun has its own individual name, El Invencible standing to the right of the door and San Carlos to the left. El Invencible was cast at Manila on June 11, 1791, and San Carlos also at Manila on March 12, 1799. The former weighs 6096 pounds and the latter 6496 pounds. It is quite probable that these highly decorative pieces never fired a shot.

An interesting member of the cannon family is a German cannon, made at the Krupp works in the years before the great war, when the Krupps had time to spend on the decoration of individual

pieces. This cannon is adorned with the imperial crown and coat of arms, and was made principally for parade use.

A curious object that is a little difficult to identify at first is a listening tower. Shaped like a beehive, it is built of six overlapping rings and a cap of steel, with narrow slits for listening and observing. The tower was placed over a hole in the ground in which the observer stood, and is tall enough to cover head and shoulders.

The oldest warfare brought to mind by the museum collection is that of the period when men went clad in mail and fought with huge two-handed swords and battle axes. The collection of European armor is representative principally of the sixteenth century, and most of the specimens are German, although there are a few French suits. Three astonishingly elaborate suits show the type of armor worn by Oriental warriors.

The pre-Norman period covers all the armor of antiquity, the cuirass of the Roman soldier, the Greek types and the partial coverings of the early centuries.

By the beginning of the twelfth century the typical Norman armor had developed. This was a combination of metal plates and tanned leather, completely covering the body. There was usually a conical helmet with nasal or nose protector. The body covering was of metal plates, and the legs and feet were guarded by pliable, metal-studded chausses. The shield was usually heart-shaped and curved to fit the body.

Chain mail is familiar to all who have ever inspected collections of armor. It is composed of an endless number of small rings laced together, each ring with four others threaded into it and the whole forming a very close, pliable and easily carried protection. The helmet of this period, known as the heaume, was commonly made with a square top and curved under the chin with a peephole for the eyes.

Chain mail being found not always sufficient protection, the suits were reinforced with sections of plate covering vital spots. This led to the next period of armor, chain mail reinforced, when the suits were heavier and more cumbersome and helmets developed curved crowns.

The hard-fought battles of the Franco-English wars developed the next form, the studded armor. It was a combination of the best features of all previous types, chain mail, plates and cuir-bouilli or tanned leather. Helmets lost their cumbersome shape and became metal hoods or bascinets, sometimes with visors.

In the transition period the beautiful lines of the earlier armor gave way to a heavy, cumbersome style, most noticeable in the Teutonic armor. The helmets were enormous affairs, with movable visors, cheek pieces and chin guards or mentonnieres. A skirt of chain mail hung from waist to knees.

With the next period came the introduction of gunpowder and the gradual abandonment of armor for use in the field. It was still worn at tournaments, however, and since it did not have to withstand heavy wear, was made most elaborate and beautiful. Emperor Maximilian was particularly fond of ornate and beautiful armor, and the style is named after him.

The last stage of armor, or half-armor, was a strictly utilitarian period, when sections of plate were worn merely to cover vital parts of the body, without regard for beauty. In the seventeenth century armor began to be grotesque. The cuirass dwindled to a small flat breastplate; the metal greaves which had covered the legs were replaced

by high-top boots of leather, and instead of the serviceable shoes of mail, low slippers with their points turned rakishly back were worn. By the time of Louis XIV armor had disappeared altogether, and was replaced by suits of tanned leather.

James I of England is credited with the shrewd remark that armor was a very useful invention, for it not only saved the wearer from being killed, but hampered him so that he was unable to kill anyone else.

Japanese and Chinese armor has always been of an elaborate and fantastic type. The helmets were commonly made as hideous as possible, with ferocious false mustaches, iron masks cast in terrifying expressions, and long beards of horsehair, in order to strike terror to the enemy. The usual Japanese armor, well illustrated by the museum specimens, was made largely of lacquered metal plates, strung together with silk on the principle of Venetian blinds. These suits were handed down from generation to generation, the silk padding being renewed when necessary. The practice of wearing armor was a persistent one, especially among the old nobility of Japan. The conservatives clung to their armor to a period as late as the middle of the nineteenth century. In the civil war of 1859, when the more liberal party set up its new government, the soldiers of the conservatives still wore armor. It was left for the liberal leaders to introduce Occidental methods of warfare

Japanese bows were usually made in two pieces of unequal length, and appear clumsy beside the European specimens. The bowmen knelt to shoot.

The museum collection of armor represents both the type worn by the mounted knight and lansquenet armor, or that worn by foot soldiers. The term lansquenet is derived from the German landsknecht, or foot soldier, which was applied to German soldiers, especially mercenaries, serving during the fifteenth to seventeenth centuries.

The full armor includes several complete suits of the fifteenth and sixteenth centuries, coats of mail and individual pieces. Notable among the number are two Nuremberg suits of about 1540, polished black with white etched or embossed stripes. An Austrian suit, complete, of the period of 1550, is from the famous Zschille collection at Graz. French armor of the same period is also shown, both in the case and worn by the figure mounted on a horse in the center of the room.

The lansquenet armor includes several specimens of German work. Among them is a suit worn by a lansquenet drummer in the sixteenth century. The head of the figure on which the armor is placed is a sixteenth century German carved mask. The fleur-de-lis embossed on the morion or helmet has no connection with France, but is the badge of the civic regiment of Munich and the symbol of the Virgin.

The value of European armor of this period is indicated by prices paid at a French sale not long ago, at which a rare Italian helmet of the sixteenth century brought 61,000 francs; a French half-suit and gauntlets of the sixteenth century, 27,000 francs; a fifteenth century coat of mail, 1550 francs; a pair of fifteenth century gauntlets, 1300 francs, and so on.

The Oriental armor in the museum includes several complete suits of traditional style. One Japanese warrior is mounted, and the others stand in the wall cases, this group including a bowman in a quaint and picturesque costume.

Protection of the head has always been sought by fighters, from the Roman soldier with his helmet to the soldier of 1918 with his "tin hat." Many types of head guard have been developed, and much attention was paid to ornamentation. The museum has a large collection of helmets, both originals and reproductions of old specimens. The oldest types of all are to be found in the Egyptian and Pompeian rooms, where are some excellent reproductions of the bronze helmets worn by the Roman legionaries.

In the Armor Hall the helmet collection ranges from the heavy metal protectors of ancient times to the elaborate plumed helmets of the French cuirassiers and the very recent trench helmets. Germany is largely represented by originals and reproductions of the head guards worn by the different regiments and classes of fighting men—Prussian shakos, Saxon caps, artillery caps, metal helmets of various types and other specimens. There is a large collection of French material, First and Second Empire predominating, and showing the contrast between the headgear worn by the men of different classes of service. The plumed helmets of the cuirassiers, so often seen in battle pictures of the period—as, for example, in "La Prise du Drapeau," by Jules Desvarreux, in the museum galleries—are well represented.

Placed with the relics of the late war are a large number of helmets of a more modern type, as well as many trench caps, fatigue caps, headgear for special occasions and the distinctive helmets of such regiments as the German Hussars of Death, this huge black shako bearing the white skull and crossbones.

Among this array are several new and unworn helmets of an elaborate type that suggest one of the grim satires of the war. They were taken from a collection found stored in a secret hiding place in a village seventy-five miles outside Paris, and were intended to be worn by the Germans on their triumphal entry into Paris, an entry which was unavoidably prevented.

Another collection of interest and value is the display of epaulets of all periods and types, arranged in the case with the helmets.

Turning to relics pertaining especially to the late war, the visitor will find a collection of great interest and value, covering every conceivable feature of the four years' struggle. In the display are all types of machine guns, rifles, small arms, grenades, bombs, projectiles, shell cases, air plane bombs, gas shells, bayonets, swords, gas masks, trench material of every description from periscopes to entrenching tools, smoke machines, relics from ruined cities, fragments of captured planes and guns, trench kits—in a word, a representative collection of all the vast mass of material made necessary by modern warfare.

The guns alone make an interesting and varied display. In addition to many types of rifles from the different armies, there are several machine guns with the long belts of cartridges; rapid-fire guns for airplane use; "Archies" or anti-aircraft guns; anti-tank rifles, carbines and a dozen others.

Grenades and bombs are of all types, German, Austrian and French. Cases are filled with projectiles, shell cases, cartridges, rifle bullets, incendiary bullets, the vicious dum-dum or soft-nosed bullet, gas shells, bullets designed to pierce the armor of tanks, dispatch shells used for their special purpose, airplane bombs and darts dropped by German aviators, depth bombs or "ash cans," bomb throwers of all types and several huge brass shell cases, about three and a half feet tall and ten inches in diameter, that are reminders of the days when

"Big Bertha" was bombarding Paris. The student of these matters will find several interesting displays of cartridges, arranged to show their construction, especially an exhibit of Italian material in which the cartridges are cut in half to illustrate their structure.

Much documentary material in regard to the European war is also gathered in this collection, some of it of great value and unique interest.

Among the examples are a number of German proclamations, posted in the captured cities and laying down rules for the conduct of the inhabitants, these proclamations invariably closing with the warning that violation of any rule would mean "immediate reprisals," which to the average German military commander meant only one thing.

One of the posters is a facsimile of the placard that appeared one day in a Belgian city, announcing that sentence had been passed upon certain individuals, among them Edith Cavell.

A picturesque episode of the war is recalled by the presence among the exhibits of a copy of La Libre Belgique, the indomitable little newspaper that appeared day by day during the German occupation of Belgium, setting forth in unsparing terms the true state of affairs, voicing vigorous condemnation of German cruelties, and so successfully keeping the secret of its abiding place that the Germans were never able to find and suppress it. Day by day Von Bissing, the military Governor of the occupied district, found a copy on his breakfast table, but never succeeded in finding out how it was placed there.

Other war publications, official documents, quantities of battle-front maps, lists of the air raids on Paris, showing details of each attack; bread tickets, ration cards, allied loan posters, sign-boards from the trenches and notice boards of all types from the war zone, an autograph letter from General Pershing and many other exhibits of interest complete this collection.

Among the war photographs are pictures of a group of tiny but very brave heroes of the battle—the carrier pigeons who served with such distinction that decorations were conferred upon them just as upon soldiers. Cher Ami is the best-known of this group. Several of the pigeons were wounded in service, and the legends below their photographs tell of dispatch-carrying journeys completed in spite of serious hurts.

A different type of war picture is represented in the collection of fifteen engravings by Gueldry, the French artist, who was officially assigned the task of preparing pictorial records of German atrocities, described in official French reports. Scenes of the utmost brutality are illustrated in these pictures, and the records on which they are based are cited in each case.

The collection of miscellaneous war material is large and varied. All phases of trench life are recalled by the display of the many articles that figured in the daily life of the soldier overseas. Gas masks of all types are shown, as well as the gas machines against which they were designed to guard. Relics from Verdun, Soissons and other ruined cities are supplemented by photographs and documents. Clothing and other articles manufactured from paper recall the days when the Germans began to feel the pinch of necessity.

Remembering the war clubs of the South Sea island collection, the visitor will find material for illuminating comparison in war methods in the two Austrian war clubs, used in hand-to-hand com-

bat. The Austrian club makers had the advantage of the South Sea natives in that they were supplied with steel spikes with which to stud the head of one of their clubs and barbed wire with which to wind the head of the other.

Another method of defense used by the Germans against cavalry is illustrated by the defense prongs, a development of the chevaux de frise. These ugly little weapons are clusters of sharp metal spikes, about ten inches in diameter and bristling with points in every direction. They were designed to be thrown in the path of advancing cavalry.

Looking back from the recent war to battles of older days, the visitor will find a small collection of Civil War material, bullets and trophies collected from various battlefields, battle flags, old guns and similar material.

The representation of Spanish war and Philippine insurrection material occupies a special case, and includes a number of very interesting relics. In the general display are guns, rifles, shells, cartridges and similar material, as well as many trophies taken from captured Spaniards or conquered natives.

Relics of the Maine include a fragment of twisted armor plate and bits of metal from the ill-fated battle-ship. Naval engagements of those days are recalled by fragments of glass from the port light of the Reina Cristina, the Spanish flagship at Manila. To what extremities the Spanish were driven by their lack of war material is shown by the stone cannon ball, taken from the Spanish war ship Ulloa at Manila, May 1, 1898, when the Spaniards were reduced to using such antiquated missiles for lack of iron and steel.

Several interesting flags find place in this collection, among them several Filipino battle flags captured from the insurrectos. These are usually of red cloth with crude designs in white, cut out and roughly sewed on the red background. A flag of historical interest is the guidon, once the property of Troop F, 2d Squadron, 11th Cavalry, which was used at San Mateo Marguinee, the station where General Lawton was killed in December, 1899. The guidon saw service for two years and three months, and was in thirty-one engagements.

A flag with a curious history is the triangular Boxer flag of red and white. This trophy was presented to the Museum by H. H. McCormick, who captured it in June, 1900, from the Taku forts. He took it with him on his adventurous wanderings from that time until December, 1919, when he presented it to the Museum. The flag mascot traveled with its owner from China to South America, where he took part in various revolutionary activities; then to the United States, where McCormick joined the Coast Artillery and went to the Philippines with the California Volunteers to help subdue the insurrectionists; then to Ecuador, where McCormick engaged in the peaceful pursuit of engineering. This quiet existence lasted only until McCormick heard rumors that the United States might become involved in the great war, whereupon he promptly returned to his own country, enlisted and went overseas in 1917 with the 316th Sanitary Train, 91st Division. He saw service in the battles of St. Mihiel, Meuse, Argonne, Ypres and Lys and managed to carry his unique mascot with him.

McCormick informed the Museum authorities when he presented the flag that Chinese frequently refused to interpret the characters which adorn it and declare that they are afraid to touch the flag.

The general display of military material is extremely valuable

and interesting. In addition to the scores of weapons used in the wall adornment there are several cases filled with guns, pistols, swords, knives, daggers and other weapons, as well as a large and valuable collection of powder horns, spurs, touch boxes and other objects.

After primitive man had progressed beyond the stage of stone throwing and had discovered the principle of the slungshot and the bow and arrow, growth in the making of projectile-throwing weapons was slow until the Middle Ages. The bow and arrow satisfied the warrior of the early centuries. Catapults were developed by the ancient nations, but they were heavy and clumsy affairs, suitable only for the siege of fortified cities. The warrior, whether on foot or horseback, was content with his sword, his battle-ax, his dagger, and even the bow and arrow were left to specialized troops.

The bowmen of the centuries, when Europe was in a constant state of turmoil, were a definite part of the fighting force, and developed their own technique of battle. The short bows of the earlier years were adapted by these students of archery into the famous longbow of the tenth to twelfth centuries. The English bowmen were masters of the art; their exploits have formed the material for many a picturesque tale.

The first development from the bow was the crossbow, a mechanism by which bolts instead of arrows were shot from a heavy and rather clumsy weapon in which the cord was mechanically drawn back instead of being pulled by hand. The crossbow was held flat instead of perpendicularly, as was the case with the longbow.

Crossbows date back to the tenth century, and by the twelfth century they were in general use in France, the English still holding to their longbows. Unlike the usual course of events, the old style proved better than the new. English archers of the period far surpassed the French crossbowmen, being able to send a flight of twelve arrows while the users of the new weapon were firing three of their short, heavy bolts. The strings of the crossbows, being permanently affixed to the weapon, and not detachable, as with the old-style bows, could not be protected from the rain, and often lost their elasticity at the critical moment.

The battle of Crecy in 1346 offered final proof of the inadequacy of the crossbow, and after the battle of Poitiers, when English archers again outfought their opponents, armed with crossbows, the use of the crossbow in battle was gradually abandoned, although it was still used for hunting. Not until the introduction of gunpowder, which entirely revolutionized the methods of warfare in Europe, was a definite change made in weapons.

The ancestor of the modern rifle, with its delicate and complex mechanism, was a very simple affair—the culverin of the fifteenth century. This first small arm in which the new discovery, gunpowder was used, was merely a straight tube of metal half an inch or larger in diameter, fixed to a wooden or iron handle, with a touchhole and flashpan at the side. It was fired by the primitive method of thrusting a lighted match into the touchhole, igniting the charge. The smaller culverins, weighing about fifteen pounds, were carried by men on horseback; the larger type, weighing perhaps sixty pounds, were fired from trestles.

Later came the serpentine, which differed from the culverin in that the igniter was held by a lever descended into the flashpan. This developed into the matchlock, which had its flashpan covered by a metal lid to keep out moisture. The origin of the expression, "A

flash in the pan," is a reminiscence of failure of the powder to ignite.

The wheellock gun, invented in Nuremberg in 1515, was a complicated affair, the principal feature of which was a metal disc with a serrated edge. This was wound up by a spring and released, whereupon the disc revolved and its toothed edges scraped against a flint, producing sparks that flew into the flashpan and ignited the powder. This type of gun, however, was very expensive to make and slow to operate, so that it never became common in warfare.

After the wheellock came the flintlock, a development of the same principle of forcing contact between flint and steel. The hammer of the gun was provided with a "flint cock," and when the hammer was brought down flint and steel were brought into violent collision. Flintlocks were first used in the Netherlands and were brought to England by the soldiers who came with William of Orange. They were used for many years; old-fashioned flintlock muskets were still in use in 1840.

The American Revolution was responsible for the introduction of the rifle to the world. Of course, the rifle had been in use for a long period, but it was not generally adopted until that time.

Attempts had been made as early as the seventeenth century to contrive a weapon that would shoot straighter than the smooth-bore muskets. In 1635 a patent was granted for what was the beginning of a long line of rifles, but the real principle of the rifle was not discovered until Benjamin Robins, a gunsmith, who died in 1751, applied the principle of physics which sets forth that the flight of a forward-moving object can be controlled or affected by applying a rotating motion as it begins its flight. Robins found that by grooving the barrels of his guns so that the bullet when it emerged was spinning rapidly, he could reduce the curve induced by gravity.

However, the British Government was not particularly interested in Robins' experiments until the battles of the American Revolution began. The American frontiersmen and hunters had long before that time discovered the excellence of a rifled barrel; when their lives often depended upon the accuracy of their shooting they were not likely to overlook any improvement in gunsmithing. Consequently the British troops found themselves confronted by American woodsmen armed with guns that could outshoot anything owned by the British soldiers. The lesson was immediately learned, and before long the British armies and the other armies of Europe were equipped with straight-shooting rifles.

Pistols were developed rather early in the story, coming not long after the invention of the wheellock early in the sixteenth century and its failure to fulfill its promise. They were invented in response to a demand for small arms for horse soldiers.

Camillo Vettelli of Pistoia, in Etruria, is credited with the manufacture of the first pistol in 1540. These early pistols were large, clumsy affairs, with short barrels and heavy butts almost at right angles to the barrel. Later a more convenient angle between butt and barrel was adopted. It is sometimes difficult to tell whether a weapon of this period is a gun or a pistol; as for example the four-chambered arquebus, now in the museum of the Tower of London, which is said to have been the property of Henry VIII. The barrel of this ancient weapon is two feet nine inches long. The arquebus was usually held against the breast of the soldier instead of at the shoulder—a method of firing which must have produced rather un-

comfortable results. The stocks of the old arquebus were often elaborately inlaid, as illustrated in several Memorial Museum specimens. One of these, a sixteenth century German petronel—a development of the arquebus—is a very decorative affair.

The pistol owes most of its improvements to the custom of dueling. The hot-tempered gentlemen of the seventeenth and eighteenth centuries, when the pistol was replacing the rapier for the settlement of disputes, demanded the best available weapon for their use. Dueling pistols ordinarily came in pairs, to provide each duelist with his weapon, and were stored in cases fitted out with every possible accessory. The Memorial Museum has several specimens of dueling pistols in their cases, showing the characteristic long barrel and elaborate design.

The invention of the revolver, with its circular ammunition carrier, caused the pistol to be relegated to the uses of dueling and target shooting until comparatively recent years, when its use in military service has been revived. The pistol is declared to possess greater accuracy and greater power, and a larger supply of ammunition can be carried ready for use. Pistol cartridges are carried in clips in the stock of the weapon; revolver cartridges in a revolving drum, and where the revolver's traditional form is the six-shooter with its six available rounds, the automatic pistol can store away from eight to ten rounds, even in the smaller patterns.

The gun, musket and rifle collection in the museum covers a wide range of periods and countries. Beginning with the ancestors of the modern gun—the arrow and crossbow—the specimens include arquebuses, petronels, flintlocks of the Louis XVI period, quaint old blunderbusses with their large bore and shell-shaped muzzle, muskets of various types, carbines, rifles, many types of carbines and other weapons used by the armies of the world, and several Oriental examples.

The small arms are equally varied and interesting. In addition to the dueling pistols in their cases, there are French and English pistols, German and Austrian army examples, dating back to the early years of the nineteenth century; examples of the old horse pistols with their excessively long barrels and leather holsters, to be slung from the saddle; American cavalry pistols of 1850, Belgian derringers, many makes of English pistols, Mexican pistols with elaborately engraved barrels, and a comprehensive collection of Colt revolvers and pistols from the earliest type to the modern weapon. Several of the specimens, especially those donated by members of the Police Department of San Francisco, possess historical interest.

Allied to the display of guns and pistols is the de Young collection of powder horns. In the days when cartridges had not been invented and every musketeer had to carry his own bullets and powder, the powder horn was an important part of his equipment. The collection includes examples of mediaeval European work, early American, Oriental, Moorish and African. The European examples, principally German, Italian and French, date from the fifteenth century and the years following, and are made of horn, ivory, tortoiseshell and other materials, usually carved with elaborate designs. Forming part of this collection is a display of touchboxes in which the soldier carried a finer quality of powder for igniting the coarser powder used in the charge. This fine powder was poured into the flashpan of the weapon and carried the fire to the heavy granular powder behind the bullet.

The collection of spurs in an adjoining case includes several old and interesting specimens, one pair reputed to have been worn by Don Miguelly Costa, a member of Pizarro's expedition.

Swords and daggers form another division of the collection. The oldest sword is an ancient Roman blade of plain, unadorned metal, double-edged, with the heavy cross-hilt of the period. On the blade is a rough inscription, inlaid in silver, "Leg. VI," indicating that the sword was the property of a soldier of the Sixth Legion.

The Roman sword, with its straight blade, double edge and heavy hilt, set the type for swords until the sixteenth century. The huge two-handed swords of the fourteenth and fifteenth centuries, illustrated by several examples in the armor collection, are developments of the Roman type. As it must have taken a strong man to wear the armor of that time, so it called for a pair of strong arms to swing the massive sword that accompanied the armor. Tales of sword strokes that sheared through helmet, head and body, "to the midriff," as old writers say, are understandable in the presence of these huge weapons, which by weight alone would cleave through anything but the strongest protection.

The saber or cavalry sword, with its single cutting edge and slightly curved blade, was introduced about 1690 from the Poles and Hungarians, who in turn received it from the Turks and Saracens.

The most famous swords are Damascus blades, known alike for their beauty of appearance and their wonderful temper that permits them to be bent double without breaking. These blades were made by a method that has never been fully recovered. Authorities are uncertain whether the watered appearance of the metal is due to a cunning blending of strips of steel and iron, welded in a manner that modern armorers have been unable to copy, or to the use of a special variety of iron ore containing carbonate of iron, partially crystallized.

The tendency of Oriental swordmakers, especially in the Near East, is to curve the blade. Turkish scimitars, yataghans, Filipino bolos and other weapons are types of this shape.

The Memorial Museum sword collection is large and representative, especially in the display of swords of the French First and Second Empire period. These have elaborate hilts and guards, inlaid with precious metals or mother-of-pearl. The most gorgeous of the collection is a sword of state presented to a Hungarian nobleman by the Emperor of Austria. The scabbard of this weapon is of crimson velvet and gold, set with many-colored jewels.

The French and Spanish swords and rapiers are especially beautiful in their slender lines.

Many curious types are found among the Oriental swords. There are Turkish scimitars, curved blades sometimes with toothed edges; Egyptian swords that are so excessively curved that they describe almost a half-circle; Japanese weapons; a beautiful East Indian "Flaming Sword," with intricate engraving on the wavy blade; yataghans from Egypt, Persia, Albania and Turkey, weapons with slightly curved blades, single-edged, and usually elaborately engraved and inlaid; many bolos, machetes or heavy knives, and beheading knives from the Philippines; Javanese and East Indian creeses (sometimes spelled kris), weapons with rippled blades and carved handles; a clewang from Borneo with a handle of human bone, ornamented with human hair, and many other equally interesting specimens.

The Filipino beheading knife has seen service, judging from the tufts of human hair that decorate it, each tuft indicating a victim.

A dagger was an essential part of the costume of the man of mediaeval times, and of not a few women. Daggers were—and are—universally carried in the Far East, and the hunting knife or even the humble pocket knife of today is a descendant of the dagger of olden times.

In the museum cases are several daggers and knives of unusual interest. Among them are several examples of the European "misericorde," or mercy dagger, carried by knights to end the misery of wounded men or dispatch fallen foes. In days before the medical corps and the Red Cross a quick death was the only relief for the man who suffered serious wounds in battle, and it was the custom for these special daggers to be carried for this purpose. The museum specimens are English and date back to the sixteenth century.

The Furniture Galleries

Antique Chairs and Other Objects Fashioned by Celebrated Artists—American Contributions—Gothic, Chinese and Other Designs in Furniture—Rare Wood and Costly Inlaid Cabinets—Furniture From Many Nations.

The furniture collection at the museum is arranged in two main galleries, one devoted entirely to chairs and sofas and the other holding cabinets, chests, desks and larger articles. A few articles, such as the Napoleon throne and bed, which are closely associated with special exhibits, are placed in other parts of the museum.

The chairs are exhibited on a raised platform that circles the gallery, so that they may be inspected at ease. Many countries and periods are represented, and there are numerous pieces of great historical value.

Three interesting old chairs are German wedding chairs, bridal gifts of a century ago. They are similar in type, of heavy dark wood with straight backs and wide panel legs, elaborately and somewhat clumsily carved. Each is inscribed with the name of the owner; one bears the name of Margretta Meyer, 1855; one, that of Margretha Jurgens, Anno. 1776; and the third, that of Peter Giese, 1801. Peter Giese's chair is not only carved, but painted with brilliantly colored scrolls and floral designs.

Italy is represented by five antique chairs, the oldest a quaint Tarsia chair, made at Florence in the sixteenth century. It is of dark wood inlaid with ivory. This marquetry or inlay was a popular form of decoration for centuries, and still persists.

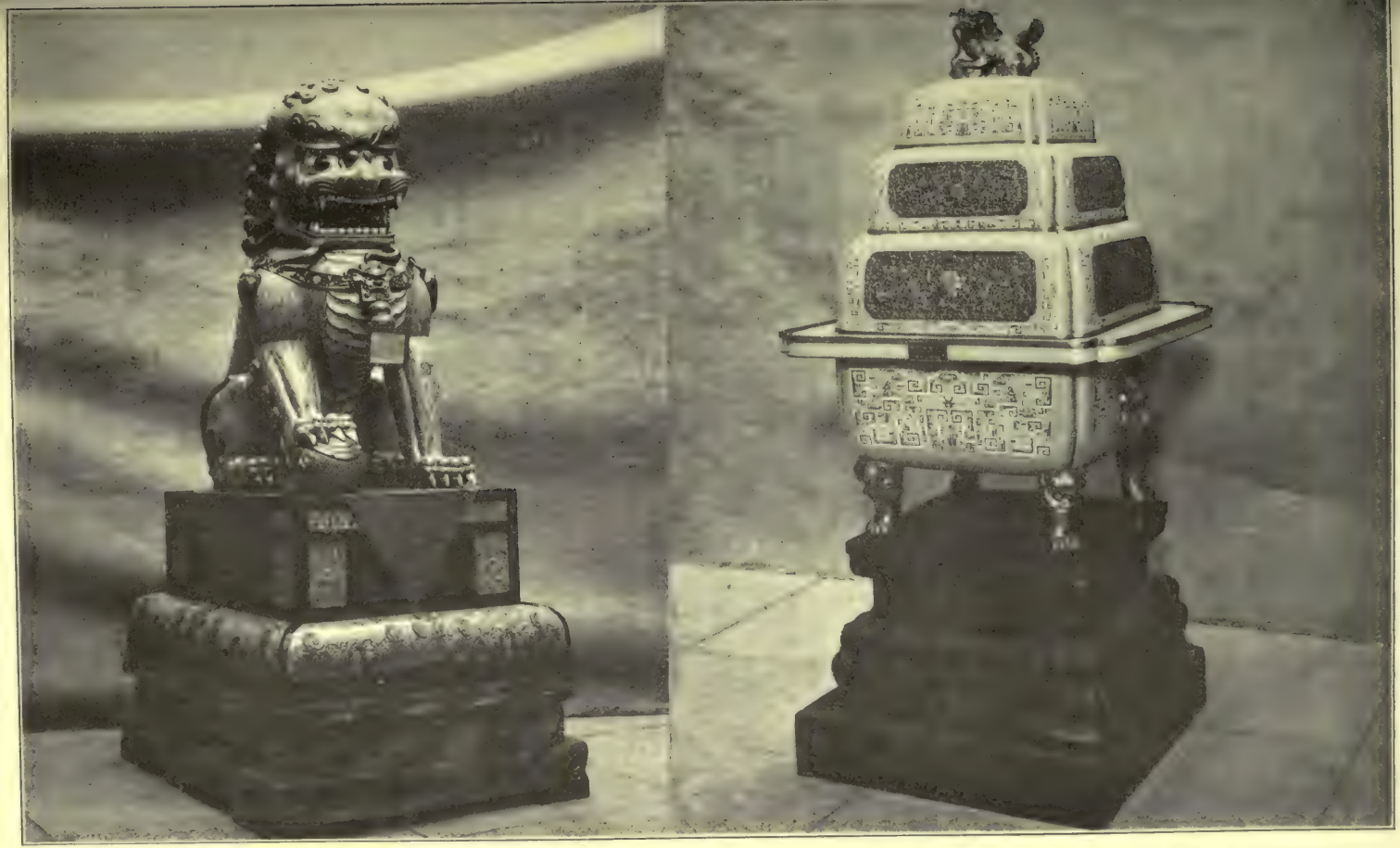
A curious bench chair, accredited to the seventeenth century, has a very narrow seat and back, upholstered with illuminated and gilded leather, and the wood of the chair is carved.

A Venetian armchair is heavily carved, and a pair of slender hall chairs of the seventeenth century are carved in high relief in their straight backs, which are surmounted by baronial crowns, and on the wide panels which form the legs.

An antique Spanish chair has a slung seat of leather, darkened by time. A carved side chair and a chair that dates back to the middle of the seventeenth century are also Spanish in origin. The latter example was once the property of Don Pedro Fages, Governor of California in 1790, and later came into the possession of Frederick Low, Governor of California in 1870.

A chair of the Louis XIII period, elaborately gilded and upholstered in crimson, represents French art, and England contributes two Chippendale pieces of the period from 1760 to 1770, one a side chair and the other an armchair, as well as a Queen Anne armchair of the eighteenth century.

Two chairs of interesting history are American in origin. One is the Senate chair, a massive affair upholstered in blue velvet, which was occupied by Thomas Hart Benton, father of Jessie Benton Fre-



The male of two giant Fo Dogs, of cloisonne, with gold perforated ornaments. Used as Chinese palace guards.

Massive Chinese cloisonne incense burner, with magnificent decorations of carved and perforated gold bronze panels.

Oriental Ceramic Gallery.

mont, and later by Stephen A. Douglas. The chair dates to the period before the Civil War, when the Senate sat in the chamber now occupied by the Supreme Court. In 1859 the present Senate wing was completed and the furniture of the old room sold at auction. This chair was bought by George T. Brown, sergeant-at-arms, who presented it to his niece, Mrs. John P. Young. She, in turn, presented it to M. H. de Young for donation to the museum.

The chair, like others of the room, was designed by B. H. Latrobe, architect of the Capitol, and was made in Baltimore before 1819. Benton, its first famous occupant, was the first Senator to advocate an overland railway to California. Douglas took the chair on Benton's retirement.

The other American chair is a Heppelwhite example, which is said to have been used by George Washington when he reviewed American troops at Salem, Mass., on October 29, 1789.

Several examples of Gothic chair-making are included in the collection, such as the Baronial Hall chairs, heavily carved, and with leather upholstery, adorned with brass bosses.

Three chairs of unusual shape with unique, deeply curved backs, are from China. They are of red lacquer, decorated with gold. Another Chinese piece is the teakwood settle, heavily carved with panels of grapes and figures.

A teakwood sofa of unusual interest is an East Indian affair, a replica of the one presented to Edward VII. The story of Buddha is told in the panels, carved in complicated detail with figures, flowers, scrolls and conventional designs.

East India is also represented by a teakwood table and chair, beautifully carved. The carving is done in openwork design, and the back of the chair alone has been estimated to hold nearly 1000 tiny flowers. The two pieces are about 300 years old.

An odd-shaped folding chair with inlay of mother-of-pearl and a small table to match are likewise from East India.

In this gallery are the De Fremery portraits, a fine collection of examples of the old Dutch school.

In the larger furniture gallery the principal object of interest is the Spanish throne. This was erected in Seville on the occasion of a visit from Isabel of Valois, wife of Philip II. It is made up of a platform with an elaborate backing of red velvet and heavy carving, ornately gilded. Two chairs stand on the platform, also adorned with gilt and crimson and bearing the royal arms. The seats of the chairs, scarcely six inches in width, suggest that Isabel of Valois could not have passed a very comfortable hour listening to the homage of the good people of Seville. Spanish leather with the characteristic stamping and gilding covers the seats.

France is well represented in the furniture display. Some of the pieces are tables and rosewood cabinets of the First Empire period, a Louis XV cabinet, an elaborately carved chest of the Louis XIII period, a table and four chairs, upholstered in yellow silk and adorned with marquetry, that belongs to the First Empire; an odd old barometer of the regency (1715-1723), and other examples.

One interesting piece is the Boule writing desk, made in double sections like the modern hotel writing desk, and showing elaborate workmanship. Boule was a furniture maker of the period of Louis XIV, who discovered a method of inlaying dark wood or tortoise shell with brass in floral designs, vines or wreaths. The work was done with a saw, and some wonderfully beautiful and del-

icate results were obtained. Collectors prize good examples of Boule work very highly.

An odd piece in the Italian collection, perhaps more odd than beautiful, is a seventeenth century cabinet of chestnut wood, ebonized. The front of the cabinet is in many small panels, each with an inlay of semi-precious stones, lapis lazuli, agate, jasper, coral, marble or other substance.

An Italian renaissance cabinet is beautifully ornamented with ivory marquetry, and a seventeenth century cabinet bureau of walnut wood is heavily carved.

The largest pieces of furniture in the gallery are of Dutch origin. They are two enormous cabinets, one a linen press and the other a music cabinet, both of mahogany, both standing considerably more than six feet tall and massively carved. They date to the early eighteenth century and are from the De Fremery collection. Holland is also represented by an inlaid secretaire of the early eighteenth century and a black oak wardrobe of slightly later period.

A fascinating specimen in the Oriental collection is an ancient Japanese teakwood cabinet, 200 years old, which bears the simple inscription: "Many secret drawers." Certainly the elaborate carving provides a multitude of locations for hidden handles or springs.

A shrine cabinet of the Tokugawa period of Japan has doors of lacquer with bronze panels and crests. Another lacquer cabinet was presented by the Emporer of Japan to William Ralston Sr, on the completion of the Palace Hotel in October, 1875.

A Spanish elaboration of the ordinary charcoal burner is the large tarenia with copper brassero. It consists of a pedestal of dark wood, eight-sided, with panels of inlay on top. In the center rests a very large copper bowl of hammered workmanship, very beautifully designed and made, with handles at the side.

Smaller objects of interest in this room include the writing desk used by General Vallejo and presented by his heirs; an antique Gothic coffer; Colonial mirrors and other smaller pieces.

The collection of chests and coffers is of remarkable interest and representative display. Perhaps the most valuable and certainly the most beautiful pieces are two Italian cassone or trousseau chests, designed to hold the wedding outfits of seventeenth century Italian brides, evidently of the nobility, since the chests are elaborate and huge.

One of these chests, some six feet long, about three feet wide and nearly three feet high, is an elaborate gilded affair. At the corners, winged figures serve as supports, resting on couchant lions. The lid is heavily carved and gilded, and the sides are decorated with painted panels representing knights and squires riding along a meadow pathway.

The second Italian chest, slightly smaller, is even more beautiful. It is entirely covered with an intricate hand-carved design in conventional style with fleur-de-lis and lions rampant in adjoining diamond-shaped frames. The background for these two motifs, which are in relief, is a beautiful hammered effect. The end panels are done in the fleur-de-lis motif. The gilding of this chest has a tinge of copper that, with the brilliancy of the gilded relief where portions have been rubbed bright, makes a wonderfully striking effect.

How treasures are found by accident is illustrated in the case of one of the old German wedding chests, a fifteenth century example, leather covered, with mountings of hammered copper. Mr. de Young was exploring the shop of a curio dealer in a little German city,

searching for anything that might be of interest. He found this chest being used as a catchall for waste paper and junk; the dealer had absolutely no idea of its value.

There are two seventeenth century chests from Nuremberg, both of wood, with metal hinges and mountings.

A quaint old Norwegian wooden trunk, elaborately painted with floral designs, bears the initials, "J. J. D. A.," and the date 1832 in intricate scrolls on the side.

A Spanish chest of light wood, elaborately inlaid and equipped with heavy brass hinges and feet, was brought to Mexico during the time of Cortez in the early years of the sixteenth century.

A beautiful black and gold lacquer chest of unmistakable Oriental origin was once the property of the Daimyo of Sendai in Japan, and served to carry gifts to the Shogun. At each end of the chest a square handle turns up, projecting just above the top of the chest. Through these handles a pole was thrust along the length of the coffer, and coolies carried the load on their shoulders—a heavy load, if the Daimyo happened to be sending the Shogun gifts of any appreciable weight.

The Mission and Pioneer Gallery

A Wealth of Material of Great Historical Value—Photographs, Engravings and Paintings of Pioneers—Relics of Volunteer Fire-Fighting—Bells and Apparatus With a Story Attached to Them—Relics of Early Gold Mining and Miners — Paintings, Engravings and Relics of the Missions.

No other gallery in the Memorial Museum is so representative in the matter of donors as the Pioneer gallery. As soon as a place was made available, pioneers and descendants of pioneers of San Francisco and, indeed, of the entire State, hastened to contribute their treasures. The wealth of material relating to the early history of San Francisco is of great value, particularly as it represents a mass of information and an array of relics that could never be replaced should accident destroy them.

From the beginning of the Pioneer gallery an effort has been made to collect all possible photographs and pictures of California pioneers. The walls of the gallery are covered with oldtime crayon portraits, stiffly posed photographs, and oil paintings. Including the collection of pictures representing the Exempt Firemen's Association, and the individual pictures gathered in group photographs, it has been estimated that the collection contains pictures of about 9000 men and women who assisted in the early upbuilding of the city and State. There are nearly 400 large pictures alone.

Many noted characters of early days are represented in the pictures. The earliest, perhaps, is Junipero Serra, whose portrait in oils is placed in the annex devoted principally to Mission material. San Franciscans, in days when the stirring events of '49 have become dim and distant history, may gaze upon the pictures of such famous men as "Fighting Joe" Hooker, General Bennett S. Riley, the military Governor of California in 1849, who called the convention to frame a constitution for the State; William T. Coleman, president of the first Vigilance committee; Peter H. Burnett, first Governor of California; Thomas Starr King, who practically kept California in the Union; Peter Lassen, for whom Mount Lassen was named; General J. A. Sutter of Sutter's Fort; James Marshall, discoverer of gold; the famous financiers of early days, pioneer Congressmen and State politicians; men who founded cities—now large and flourishing.

Picturesque events in the life of San Francisco are recalled by such pictures as those of Samuel Tetlow, proprietor of the widely known old Bella Union; Tiburcio Vasquez, the notorious bandit, who was executed at San Jose in 1875, after a long struggle against the Americans; Robert Woodward and C. J. Woodward of Woodward's Gardens; James King of William, central figure of San Francisco's first administrative upheaval; David C. Broderick and David Terry, participants in the famous duel; Emperor Norton, the eccentric;

Samuel Brannan, who brought a party of 236 persons, including many Mormons, to San Francisco in 1846; Lola Montez, the dancer; Lansisis, the Indian guide, who took the first white man into the Yosemite in 1873, and hundreds of others.

Marble and bronze busts further portray a number of well-known citizens, the collection including a bust modeled from the death mask of Broderick.

Prominent in the display is the old fire engine, "Hand Engine, No. 1," which was used by No. 5 Knickerbocker Engine Company, organized in October, 1850, with James H. Cutter as first foreman. In those days there was no such thing as a municipal fire department; the work was in the hands of volunteer companies, and there was keen rivalry between them as to excellence of equipment, efficiency of work, and so on.

This fire engine, pulled by hand, was considered the best there was until the Monumentals, a rival company, forged ahead by purchasing the first steam engine. The Knickerbockers promptly ordered a steam engine, but it did not arrive until 1865, and the old hand engine stayed in service.

When William B. Fairman of the famous old Exchange saloon on Kearny street was foreman, the steam engine appeared at last, and the old hand machine was sold to Petaluma. There it was used for several years until steam engines were introduced. It was kept in Petaluma as a relic until January, 1920, when the citizens of Petaluma presented it to the museum.

The greater part of the exhibit that has to do with the fire companies of pioneer days is in the annex to the main gallery. Here the Exempt Firemen's Association, an organization made up of members of the old volunteer companies, has placed a large collection of relics, including hundreds of photographs of its members, fire helmets, belts, badges, certificates, medals, name plates from engines, trophies, company pictures, trumpets, cups awarded for special acts of valor, programmes of benefits and entertainments and so on.

Here is to be found the first fire bell that sounded the alarm in San Francisco. This great bell was cast in Boston in 1853 and immediately sent to San Francisco, where it was installed in the tower of the City Hall, then on Kearny street in the building which had previously been the Jenny Lind Theater. In those days there were no fire alarm boxes nor telephone system, and the firemen kept watch from the tower in eight-hour watches, covering the entire day and night. When a fire was seen the watchman guessed at the district and rang the bell for the alarm, ringing the number of the section. What happened in the case of fires that did not make themselves sufficiently visible to attract the attention of the watchman may be imagined; someone tearing frantically through the streets to give the alarm.

In April, 1906, this bell was hanging in the quarters of the Exempt Firemen on Brenham place, and on the morning of April 18 rang its last alarm. Toppling from its tower the bell cracked in the fall and was buried in the ruins. J. J. Guilfoyl, secretary of the Association, carefully marked the place where it was buried, and when the lot was cleared and graded, rescued the bell for presentation to the museum.

The bell bears the inscription: "Cast by Henry H. Hooper Company, Boston, 1853. San Francisco Fire Department, Organized 1850. George H. Hossefross, Chief Engineer."

Another bell of great interest is the old Oregon bell, the clamor of which told San Franciscans the news that California had been admitted to the Union. The bell was on the steamer Oregon, which brought the news. As she passed through the Golden Gate her whistle was tied down and this bell was clanging furiously. Later the Oregon was converted into a barkentine and operated in coastwise lumber trade. The bell was taken out at Puget Sound and placed at the door of the cookhouse in Charles Adams' Company's mill at Seabeck, where for several years it performed the humble service of calling the millworkers to meals. Later it was sent to Port Hadlock mill for similar service. In 1913 the historic value of the bell was recognized, and, traveling in state aboard the steamer Umatilla, it came to San Francisco to be placed in the museum.

A curious relic is a large bowl of earthenware, evidently of Chinese make. It was found thirty feet underground when excavations were in progress for a building at Battery and Commercial streets, and since the building originally on that site had stood there for years, the bowl must have been buried long ago. It is an enormous affair, the size of a washtub, and of a curious green shade from its long burial.

Relics of the old seafaring days are found in the safe from the office of the Ladies' Seamen's Friend Society of the Port of San Francisco, an organization which flourished in 1852; the slab from the old Seamen's Home, and a fascinating old register from the Sailors' Home, covering the period of January, 1857, to January, 1862. It is notable that the most of the entries, in which the name of the man is followed by that of his ship, the vessels are sailing ships, steamers being comparatively few. The old records are full of human interest in the brief notes that accompany the entries: "left without paying," "left for the mines," and so on.

The beginning of transcontinental railroading is shown in the picture, "Driving the Last Spike," painted by Thomas Hill at the order of Leland Stanford in 1876. It shows the scene at the driving of the last spike to connect the Union and Central Pacific Railroads on May 10, 1869, at Promontory, Utah, in sight of the Great Salt Lake. The work was begun by Charles Crocker, turning the first shovelful of earth at Sacramento on May 12, 1864. The last spike was driven by Senator Stanford, who occupies a prominent position in the center of the picture, sledge in hand. The picture is notable less for artistic value than from the fact that the men and women portrayed are those who actually attended the ceremony, and the faces are their portraits.

"Days of old, days of gold," are made vivid by a collection of old-time mining tools, a rocker, a prospecting pan that has evidently seen hard usage, a broken shovel and other tools; photographs of Sutter's Fort, the scene of the discovery; autographs of Marshall and his companions; old scales for the weighing of gold dust; money belts, and coin sacks used by the early express companies, and many documents and clippings relating to the gold discovery and the following gold rush. A rude washboard used in a mining camp suggests the primitive housekeeping of the miners.

The first printing press set up in San Francisco is now in the museum. It is an early type of the Hoe press, worked with a screw, and was brought around the Horn by Samuel Brannan in 1846. On it was printed the first newspaper to be issued in the State, "The Californian," published at Monterey on August 15, 1846. Set up in an old grist mill

in San Francisco, the press was used to print proclamations, official documents and other material. In 1850 it was sent to Marysville, and in 1852 to Auburn, where it was used to print the Placer Herald. J. A. Filcher donated it to the museum.

An interesting relic is the first public clock in San Francisco, which, for years held its place in the tower of the building at 425 Montgomery street. It was brought across Panama by Alexander Austin in 1852. The face of the clock is of glass and the numerals are gilt.

In the cases in the Pioneer gallery is a vast quantity of miscellaneous material relating to the early history of the city and State. Thousands of documents of all descriptions are there, ranging from election material of the first elections to theater programmes and banquet menus. It seems as if there could not have been a public occasion of any description in San Francisco which was not commemorated by some one who kept the programme, ticket, announcement or newspaper clipping and later presented it to the museum.

City administrative material is also largely represented, including such items as pioneer proclamations, official publications, codes of city ordinances, etc. There is also a quantity of early financial and commercial material, such as checks, receipts, deeds, orders, contracts and so on.

Among these is what is probably the first labor contract made with a Chinese. It is a contract drawn up at Hongkong on July 26, 1849, between Jacob P. Leese of San Francisco, and Anye, a Chinese, the latter agreeing to ship on the vessel, Eveline, to San Francisco, there to serve as a tailor for three years for $15 a month, with an advance of $30.

The history of San Francisco transportation is shown in the collection of material referring to early street car systems, particularly that contributed by George Wicks, who, at the time of his death, in November, 1912, was the oldest street railway employe in California, beginning his service when there was one horse car line out Mission street.

Cartoons by E. Jump, a well-known cartoonist of 1865-1866, show picturesque characters of that period, such as "Emperor" Norton, Washington Coombs, who looked and dressed like Washington, the Gutter Snipe, who gathered cigar ends; Hungry Joe, who always carried crackers in his pockets; the Horrible Turk, who went about in Turkish costume; Belle Cora, wife of Charles Cora; Rosy, the tramp; the Great Unknown, a famous mystery man; Miser Phil, and many others.

A valuable collection includes the Vallejo relics, presented by the heirs of General Vallejo, and including epaulets, hat and shoulder straps, saddle blankets gold embroidered, saddle ornaments, gold dust scales, account book, etc.

Vallejo (1808-1890) was an officer of the Mexican army during the temporary independence of Alta California. In 1837 he was military head of that government. He surrendered to Fremont and was confined for six days at Sutter's Fort, then released on parole, and took no further part in operations against the Americans. For a time he was the wealthiest land owner in California. Vallejo street in San Francisco, and the town of Vallejo bear his name.

Other interesting relics are a handful of iron spikes taken from the hull of an old ship uncovered, October 26, 1911, while excavating for a building at Battery and Clay streets. The ancient wreck of oak

timbers is believed to have been the Spanish ship El Carlos or El Filipino, one of the first ships to sail through the Golden Gate. There were two Spanish vessels named El Carlos, one a packet boat that plied between San Diego and Monterey, and the other a ship built to carry on explorations and visit the Philippines. This transpacific duty gave her her alternative name. According to the best authorities, it was this latter vessel which was wrecked in March, 1797, lying undiscovered under the silt and sand of the lower section of the city until 1911. El Filipino, built at San Blas, is mentioned in records of 1788 as being in the far north, investigating reported activities of Russians. She is referred to by Vancouver in his reports. In March, 1797, she set sail from the Spanish port of San Francisco for San Blas, struck on the rocks under Point Bonita, and sprung a leak. Water gained rapidly, say the old records, and she was run ashore close under what is now the southern limit of Telegraph Hill, and then was a rocky point, projecting into the bay. It was in this locality that the relics were found.

Souvenirs of the reckless days of bandits and highwaymen are plentiful. There is a cut-off Colt, used by Charles F. Bludworth, one of the posse which took Joaquin Murietta and Manuel Garcia, the famous bandits. Bludworth claimed that a shot from his pistol brought down Murietta, but there are other claimants for the distinction of ending the career of the notorious bandit.

Another grim relic is a rusty knife of the type carried by miners and frontiersmen, which, according to the donor, A. Madsen, was found thrust between the ribs of a skeleton in a lonely spot near the summit of Mount Rainier. Some tragedy of long ago is hinted in the worn old knife.

The Vigilance committees and their activities are commemorated by many relics. There are certificates of membership in the Vigilantes, photographs of such memorable scenes as the execution of Casey and Cora, pieces of rope used by the hangman, wood from the "execution tree" at Hangtown, the grim name of which was later changed to the milder title of Placerville; documents, personal relics and other material.

Military organizations are represented by many souvenirs, such as certificates of membership in the first California National Guard, commission, photographs, flags and trophies, with several quaint old drawings showing the companies at drill. Two historic flags are the Bear flag from Sonoma county and the Stars and Stripes carried by the New York company of volunteers in the Mexican war of 1848. Old Mexican weapons in the collection were dug up in Portsmouth Square and the surrounding district, buried there when the approach of the Americans threatened.

The principal feature of the Mission collection is the series of twenty-one paintings by Oriana Day, presented by Mrs. Eleanor Martin. These depict the California Missions, not in their present state of ruin, but as they were in their grandeur. The paintings were done in the years between 1867 and 1884, and the artist drew for material on old woodcuts, information from persons who remembered the glorious days of the Missions, and inspection of buildings then standing but now fallen into ruin. Padres, Indians and other figures of the period are used to give life to the compositions. The collection is valued at $12,000.

Other paintings show characteristic scenes in Mission life, and numerous models, photographs, fragments of tile and articles made by Mission neophytes help to visualize the life of the Missions.

The museum is also fortunate in possessing the Cowan collection of books and manuscripts relating to the early history of California. This collection, containing 4000 specimens, is the largest private collection of the kind in existence. In it are many valuable books and unpublished manuscripts, such as Spanish diaries, reports and letters from explorers and missionaries.

The Sutter heirs have contributed valuable relics of General J. A. Sutter, including paintings, albums, documents and other material, especially relating to the discovery of gold.

California Wood Exhibit

Polished Slabs From California Trees—Huge Slab From Sequoia—Models of Indian Villages.

Lining the walls of one of the galleries of the old unit are specimens of the woods produced by California trees. These polished slabs illustrate the varying types of wood and the beautiful veining that may be adapted to decorative uses.

Conspicuous in the exhibit is a huge slab cut from a California giant Sequoia. The section was cut vertically down the tree, evidently near the base, and shows the slope of the sides. In its present state it measures 16 feet 9 inches across, but the thick bark, now removed, must have added at least two or three feet more.

Another notable object is a section of a huge redwood burl, or knot, several feet in diameter and beautifully grained.

The woods are arranged by classes—oak, walnut, cedars and so on. The trees represented include redwood, birdseye maple, cedar, alder, sugar pine, white cedar, Spanish cedar, laurel, wild cherry, white oak, black oak, chestnut oak, live oak, sycamore, camphor, locust, eucalyptus, myrtle, walnut and others.

The floor space of this gallery is occupied by a number of excellent models of Arizona Indian pueblos.

Capitals, rosettes, bits of frieze and other decorative objects carved from California wood, fragments of massive redwood bark, examples of the bark of other trees, and several slabs of wood, in which the graining has taken curious forms, resembling animals or human beings, are also shown.

The Nautical Gallery

Models of Ships and Relics of the Sea With a Historical Value—Photographs and Maps—Engravings of Old Ships and Figureheads.

Intimately linked with San Francisco's history and her character as a great seaport city is the collection housed in the nautical gallery, a collection including models of ships, relics of old seafaring days, articles of great historical value, and many photographs and paintings of San Francisco harbor and the ships that sailed in and out.

How the nautical gallery came into being was told by Mr. de Young in a speech some time ago.

"About two years ago," he said, "an idea struck me that because San Francisco was a great shipping port with a great harbor in which ships are lying all the time, and large enough to hold the entire merchant fleet of the world, we ought to be able to get together a wonderful collection of nautical material. This idea took root, and I made up my mind that we would have a nautical room. I sent out a number of letters to our shipping men, retired shipowners, sea captains and a number of our citizens who are interested in navigation, and asked them if they would help me get together a collection for this room.

"The result has been that there is now quite an exhibit that is steadily growing. We have models of yachts, tank steamers, old sailing ships, passenger steamers of the huge modern type, and also a collection of pictures of ships.

"Did it ever occur to you why men ever made models of ships? Many years ago, when they built ships manned by oars, called galleys, they used to build their ships as artistically as possible, and as they improved on them there was considerable competition in making the most beautiful vessels. It became the custom to make models of ships before starting to build the ship itself, instead of merely drawing plans, as they do today.

"You have seen pictures of the old admirals in their quaint old uniforms looking at and arguing over the relative merits of these models. Designers, hoping to please the authorities, made their models things of beauty, their bows carved and decorated, and every detail complete."

It was in March, 1919, that Mr. de Young wrote his letters of inquiry to shipping firms and individuals. His idea was to obtain as many models and photographs as possible of craft that have plied in the waters of San Francisco bay, on the rivers that flow into it, vessels which were built here or which sailed from this port to foreign countries.

Unfortunately a number of the firms appealed to could only respond that their models and photographs had been destroyed in the fire of 1906, but they unanimously pledged whatever co-operation would be possible, and those which still kept possession of relics of interest readily gave them for the collection.

Among the firms assisting in the preparation of the nautical exhibit were the Robert Dollar Company, Balfour, Guthrie & Co., Standard Oil Company, Union Iron Works, General Petroleum Company, Southern Pacific, Pope-Talbot Company; Toyo Kisen Kaisha, Bethlehem Shipbuilding Corporation, Charles Nelson Lumber Company, Compagnie Generale Transatlantique, J. R. Hanify Company, Oceanic Steamship Company, Pacific Mail Steamship Company. In addition to these, many individuals, retired shipowners, sea captains and others gave liberally.

A dozen models of ships, ranging from the clumsy Chinese junk to the latest word in passenger steamers, occupy places of honor in the room.

Notable among them is the model of the Standard Oil tanker Richmond, built of papier-mache, on the exact scale of one-fourth inch to the foot, weighing 250 pounds, and representing ten months of work on the part of the builder. The particular feature of the model is the fact that the starboard side of the hull is cut away, showing the interior of the vessel in complete detail, oil tanks, cabins and their fittings, even to the blankets on the bunks, and the engine room, with engines accurately reproduced in minute perfection. Marine engineers who have inspected this model declare that the miniature engine room needs only steam to make it work. So complete is the model that a study of its structure will serve almost as well as a visit to the actual ship.

The Richmond, the original of this model, has a most interesting history. She sailed from San Francisco on February 20, 1915, laden with 60,000 barrels of oil and towing the barge S. O. Co. No. 95, laden with 50,000 barrels. She was absent from her home port 496 days, covering, with her tow, about 75,000 miles. This mileage was achieved by making seven trips between New York and London and a return voyage to San Francisco by way of the Horn, with a little jaunt across the Pacific to Shanghai and Singapore before finally sighting the Golden Gate. During these voyages she delivered 770,000 barrels of oil to the allies.

The Richmond holds the record for the longest non-stop tow, 14,000 miles, from New York to Singapore, which she made in sixty-two days, at an average of 9.4 nautical miles an hour. She is now in service on the Pacific Coast.

Another model of very different type, but of unusual interest, is the wood and ivory model of the Three Brothers, whose history dates to the Civil War. Originally Vanderbilt's private yacht, the Three Brothers was turned over to the Government during the Civil War and put into service. Soon after the close of the war she was sent to the Pacific Coast. For a time she lay at the Mare Island Navy Yard, and was finally sold to George Howes & Co. In the Howes dock, at the foot of Market street, she was rebuilt into a square-rigged vessel and took the seas again as a four-masted bark, then the largest sailing vessel flying the American flag. The final chapter in her history was written when she was sold to an English firm, and her name was changed to the Emma.

The museum model, beautifully carved of wood, with blocks, mastheads, fittings and other details of ivory, shows the Three Brothers as a square-rigged ship.

Another old-time sailing vessel that is represented by a model and also by photographs is the Great Republic, the famous clipper ship of the '50s. The model, carved from wood, is a beautiful piece of work, very evidently made by some one who knew and loved ships.

All rigging is complete and the sails, properly weather worn, are furled on the yards, not taut and trim, but hastily clewed up, as if the ship might just have made port.

The Great Republic was built in Boston in 1853 and arrived in San Francisco in 1856, after a record-breaking voyage around the Horn. A newspaper clipping of that year gives an account of the voyage and the ship that reads like a breath from the days of the tea clippers and "running down the easting."

"The celebrated clipper ship, Great Republic, Captain Limeburner, arrived yesterday in ninety-one days from New York, having made the fifth best voyage between the two ports. The Great Republic is a mammoth ship, measuring 3337 tons, but carrying more than 5000 tons of assorted cargo. On her present voyage she was fifteen days and eighteen hours to the Line, beating the best previous record by thirty hours. She was forty-six days to the Horn and seventy-three days to the Equator in the Pacific, and eighteen days from there to the Heads, making the whole voyage in ninety-one days.

"The Great Republic is 325 feet long, rigged with four masts and draws twenty-four feet of water. One great feature of the vessel's sailing is that during the whole voyage she has not had her topsails taken in, no matter how hard the wind blew. She came round the Horn with skysails set fore and aft, rolling off the log at from twelve to fifteen knots per hour. Her best day's run was 417 miles."

There is an epic of the sea in that sentence, "She came round the Horn with skysails set fore and aft." It is easy to imagine that Captain Limeburner was something of a sail-carrier; but the Great Republic was an able ship and she came nobly through the bleak seas of the Horn. The quaint old picture shows her with every inch of canvas spread, and on the model one may see those very skysails, snugged down now, but not hard to picture spread taut to catch the roaring southern gales or the steady winds of the trades.

Modern times are reached once more with the steamship models. The largest of them is the model of the Tenyo Maru, one of the Toyo Kisen Kaisha boats, listed at 21,000 tons—a vivid contrast to the 3337 tons of the "mammoth ship," the Great Republic.

The Compagnie General Transatlantique contributed a model of the S. S. France, 22,500 tons, and 720 feet long, more than twice the length of the Great Republic and nearly seven times her tonnage.

The S. S. Marie, from the Oceanic Steamship Company, is a model made by W. J. Owens.

Turning from these polished, perfect models of giant liners, one comes to the three-masted bark, Alice Buck, a model painstakingly carved from wood by Captain Jabez Snow in 1874. H. M. Tomlinson, himself a lover of ships and a master of words in which to praise them, in "Old Junk," quotes these words from Stevenson's "Ebb Tide": "Nothing so affecting as ships. The ruins of an empire would leave me frigid, when a bit of an old rail that an old shellback had leaned on in the middle watch would bring me up all standing."

So, perfect and faultless as the shining models of the great liners may be, the lover of ships will dwell rather on the picture of Captain Jabez Snow in 1874, whittling away at the model of a ship that he must have known in fair weather and foul, in smooth seas and stormy—the Alice Buck.

Back to modern times the visitor is drawn by the next model—the S. S. Peru, shown lying in the hydraulic dry docks of the Union Iron

Works, so that one may study the method of shoring up a ship preparatory to work on her.

Two large models are those of the S. S. Imperator and Victoria Luise, giants among the surrendered German liners. The Imperator was the first vessel to be surrendered to the Americans under the terms of the armistice and was the first German ship to sail for the United States under the American flag. She arrived in New York in May, 1919, carrying 4000 passengers, including returning troops, war brides, official dignitaries and others.

There is an interesting model of the frigate James Monroe, showing the typical gun ports in her lofty sides.

Oriental methods of water travel are shown in two models of Chinese junks, one an elaborate affair, carved from teakwood, and manned by a piratical crew of Chinese. This is the type of vessel used by the Chinese river and shore pirates, and many an unlucky vessel has read her doom in the approach of just such a clumsy craft.

Another Oriental craft is the casco, or Filipino small boat, such as is used on the river at Manila for traffic with ships lying in the stream or by the natives for river travel. During the Filipino insurrection the natives, fighting against the Americans, used this type of craft for their maneuvers. It is a canoe-shaped affair, clumsily built, with sagging matting awnings.

Many relics of old-time ships are finding their place in the Memorial Museum, as well as souvenirs of important events that have to do with the sea. One of the most remarkable relics is the battered life belt from the steamship Stanley Dollar. This tangle of broken cordage and cork has made one of the most astonishing journeys recorded for a bit of flotsam. The Stanley Dollar was wrecked at the entrance to Tokio bay, Japan. Six years later the life belt was picked up on the coast of Papa Stour, Shetland Islands, halfway around the globe from the Japanese bay where it was flung into the sea. How the belt traveled the thousands of miles between Japan and the Shetland Islands, whether it went through the Northwest passage or by some undiscovered route, is a secret that it will never tell.

The student of the lines of ships may find interesting material in the half-hull models of passenger steamers, naval vessels and racing yachts, showing the varying types of hull line followed by the designers.

A rare treasure of this exhibit is a worn, battered piece of wood, a timber about eight feet long and some two feet thick, one end curved sharply upward. Many museums would install a special case to hold a fragment of this timber, and, indeed, the Memorial Museum for years treasured a bit of the wood in another collection before a recheck of exhibits disclosed the presence of the larger specimen.

The timber is the stem of the Natalie, the vessel on which Napoleon voyaged from Elba to France to begin the stormy time of the Hundred Days. It was a curious coincidence that brought the Natalie's stem to San Francisco. In 1843 a vessel went ashore at Monterey bay, thousands of miles from the scene of the historic voyage to the shores of France, and only a few miles from San Francisco. She was the Natalie, and this fragment of her stem, cast up by the waves, passed through many vicissitudes before finding a peaceful resting place in the museum.

Relics of another wreck are the escutcheon and bottle rack flung ashore from a Norwegian vessel wrecked on the Pacific Coast.

Somewhere off the Alaskan coast a whaler was battered to pieces years ago. Her sea-worn anchor, red with rust, now lies in the museum,

a mute relic of long battles with sea and storm. Other relics of the old whaling days are an old whale gun and harpoon, and a diver's air pump and helmet in the style of years ago suggest sunken wrecks and lost treasure.

An old-time sailing vessel once answered to the spin of the tall pilot wheel that stands among the nautical exhibits, a wheel worn by the grip of hard-fisted sailors, standing their trick.

The historic voyage of the Gjoa, the stanch little sloop that, with Captain Roald Amundsen in command, pioneered the Northwest passage, is commemorated by the presence of the Gjoa's propeller and other relics. The Gjoa herself is in Golden Gate Park, close by the sound of the surf, but when weather shall have battered her and age has weakened her sound timbers, her fragments will still be in the museum.

One finds there, too, the tiller ropes and escutcheon from the captain's gig of the Pensacola, used years ago as a training ship at Yerba Buena. Later naval vessels are recalled by the collection of christening ribbons from United States vessels launched at the Union Iron Works, including several ships that won distinction in naval operations.

An old masthead lantern, the battered old lamp headlight from the once proud and mighty Pacific Mail steamer, City of Peking, and a crude hanging lamp that long ago hung from the beams of a ship's cabin and swung to and fro with the roll of the seas, are there, and in contrast to these remembrances of days on salt water is a tiny model airplane, built by W. A. H. Kohler of Redwood City from fragments of the planes used by Beachey, Pettirossi, Niles, Christofferson, Sutro, Art Smith and Rybitski, great names in the history of California aviation.

The nautical exhibit is unusually rich in pictures, particularly in old-line engravings and photographs of ships of years ago and in the collection of San Francisco water front maps and drawings.

Transpacific passengers, who now embark on great liners for the voyage to the Orient, will look with interest and probably not altogether with regret for the passing of the old days, on the pictures of the Pacific Mail fleet that plied Pacific waters in years gone by. The steamers are side-wheelers, clumsy of line as compared to the slim ocean racers of today, and they suggest anything but an easy passage from coast to coast.

There also are many pictures of famous ships of the early days, scenes of shipwreck, photographs of present day vessels and harbor scenes.

An interesting display is the collection of photographs of ships' figureheads, taken by L. S. Slevin, and showing the elaborately carved figureheads of American and British ships that lay in San Francisco bay twenty years ago. Few ships today carry the bow adornment that distinguished the vessels of former years, so that these photographs of figures in flowing drapery, admirals in uniform, or strange and rampant animals possess additional historical interest.

The collection of old maps and water front pictures is worthy of much study. Visitors who know San Francisco's water front only as it is today may find it difficult to imagine the bustling life of the crowded wharves replaced by the lonely solitudes of 1849, when the shore of the bay was a stretch of land almost in its primitive wilderness, crossed by a few rude streets with dim trails leading to the distant fastnesses of the Mission and the Presidio.

The younger generation, hearing old-timers talk of the time "when the water came up to Montgomery street" and, in the presence of the solidity of the Embarcadero, perhaps believing the phrase a bit of im-

agination, will find in the nautical room an ancient print showing San Francisco from the bay—and Montgomery street, so marked on the map, forms the actual water front. This is a very rare sketch, by the way, drawn on the spot in 1847, and the only known copy. San Francisco is shown as some twenty scattered buildings, the custom-house, the school, the general store, the "calaboose"—so designated—and a few houses. In the bay are shown, lying at anchor, the United States transports Loo Choo, Susan Drew and Thomas H. Perkins, the ships which brought the 1st Regiment, New York Volunteers, Colonel J. D. Stevenson commanding, to take part in the action against the Mexicans. These transports are very different from the steel-gray ships, with their funnel bands of red, white and blue, that now carry American troops. They are sailing vessels, of course, of only moderate size, and one imagines that the New York soldiers must have had a lively voyage around the Horn.

The sketch is officially certified as correct by Colonel Stevenson, General Vallejo and George Hyde, the first alcalde of the district of San Francisco.

Many more maps and sketches of similar type adorn the walls; views of the "Lombard, North Point and Greenwich docks," with the Great Republic and other vessels discharging cargo and San Franciscans in the garb of the '60s promenading on the slope above the docks to watch the work; other bay views and sketches of the city, and a collection of maps of the period of 1720-1749, which show California as an island. The oldest map in the collection is one of America, circa 1680-1693, which shows the Western Continent, the home of the "salvages," in strange form.

Indian Basket Collection

Distinctive Specimens of Many Tribes—Work of Western Indians Principally Represented—Baskets So Small They Are Bottled—Baskets That Hold Water—Alaskan Indian Basketry.

In another generation, say those who have studied the subject, the beautiful art of basket weaving among the Indian tribes will be forgotten and such collections as that in the Memorial Museum will be the only relic of a once flourishing industry that embodied tribal traditions.

Already, in many tribes, the secret of weaving the satin-smooth, wonderfully designed baskets of graceful shape is known only to a few old women, who alone remember the ancient art of extracting from bark or roots the imperishable colors that adorn the older work. Cheap chemical dyes satisfy the more impatient younger basket weavers; they choose showy and easily woven designs, no longer willing to undertake the laborious stitch by stitch weaving of the intricate patterns that to the student of basketry spell the legends of the tribe. Once the Apaches made baskets of beautiful texture and design; now the younger women complain that the stiff reeds hurt their hands, and only a few old women still practice the art.

The perfection of the work done by the old basket makers is amazing, even to students of the art, when the simplicity and crudeness of the implements used are considered. The experienced basket maker, equipped with a pile of flexible twigs or reeds, slender grasses from the marsh, perhaps a handful of feathers for decoration and a rude knife and a pointed bone awl for her only tools, is ready to produce the symmetrical and beautiful baskets, such as those which are treasured in the Museum. Her baskets are shaped over whatever is convenient; perhaps over her own bent knee or over a rounded stone. No pattern guides her in the intricacy of the design except the traditions of generations of weavers before her. For the colors of her design she chooses the natural-colored fibers of wild grass or shrubs, or resorts to the dyes extracted from alder bark or other vegetable substances. The Northern California basket maker sometimes provides a scarlet dye by chewing the red-tinged alder bark and drawing the grasses or ferns of her weaving through her mouth as she works.

The Museum baskets are principally representative of the work of the Western tribes, especially in California and Arizona, with some specimens of Alaskan work and a few Eastern baskets. The collection includes hundreds of baskets, ranging in size from the miniature Pomo specimen, one-eighth of an inch in diameter, to large plaques and bowls, and in design from the simple, plain patterns for every day use to the elaborate feather-decorated baskets of the Pomos.

These decorative examples are from Lake county, and the baskets are adorned both with color weaving and with featherwork. As is commonly the case in Indian decoration, whether it is found on

Above—Two of the four famous Dresden vases depicting the four elements, with other examples of Meissen ware.
Below—Mantel set. Specimens of bronze and porcelain decorated Sevres ware.
European Ceramic Gallery.

baskets, beadwork or blanket weaving, the designs and colors are symbolical. The red in the baskets signifies bravery and pride; yellow, success and fidelity; blue, cunning; green, watchfulness; black, conjugal love and beauty; white, riches and generosity. The materials used are maidenhair fern, desert agave, red and white alder, Indian hemp, wormwood, false saffron, California lilac, red rose and willow, and the feathers of the mallard duck, oriole, meadow lark and quail are used in the decoration. Several of the baskets are beaded.

The Pomo work is known for its delicate thread-like weave in addition to the tendency toward elaborate ornamentation. The feathers, as may be seen in some of the museum specimens, are sometimes so delicately applied that they form a fur-like nap over the entire surface, almost like the Mexican feather work. The finer baskets are often studded with bangles of shell or glass beads and pendants of abalone shell or rows of wampum.

A Pomo squaw made for C. P. Wilcomb, the Museum's first curator, several of the miniature baskets that are so tiny that they are exhibited in a slender glass bottle. Two of the baskets are half an inch in diameter, one is a quarter of an inch across and the smallest is an eighth of an inch. Wilcomb had the patience to count the stitches, and found 1200 in the half-inch baskets and 300 in the smallest. Other miniature baskets, about the size of a pea, were made by squaws of the Passamaquoddy tribe of New Brunswick.

An interesting Pomo basket, beaded and decorated with shells and red feathers, was used as a sacrificial basket. It was presented to a young Indian as a wedding gift from his mother and was intended to be burned at his death.

The Pimas of Arizona, whose work is well represented, make their baskets on a foundation of split cattail stems and the sewing is done with willow and martynia in very fine stitches with a smooth effect. Pima decoration is always elaborate.

The art of basketry is said to have been taught to the Pimas a century ago when the Maricopas, fleeing from the Yumas, sought shelter among them. At that time the Pimas made pottery but no baskets. Now the Maricopas, their teachers, have completely lost the art of basketry and make pottery only.

The Indians of Northern California, along the Klamath river in Humboldt and Siskiyou counties, use hazel twigs, sour grass, roots of young pines, maidenhair fern, chain or woodwardia fern and sometimes bird quills in their work. The weave is generally fine, the color bright and the design artistic.

In Tulare, Fresno, Mariposa and Mono counties, where the tribes are approaching extinction, the art of basketry is nearly lost. Older specimens are very rare and valuable, sometimes sold for as much as $100. Baskets made by these tribes are noted for their smooth finish both inside and out and are usually watertight. The rich amber tone of the best examples is due to age and usage.

An interesting basket from this district in the Museum is the gambling or dice tray. It is a large flat circular basket with a raised edge. The dice are half shells of walnuts filled with asphaltum, in which small glass beads or bits of abalone shells are set. The surface of the shells is polished. Gambling among the California Indians was principally a woman's game, played by two or four squaws. The old devices, such as this basket, are now obsolete, as the Indians have become thoroughly conversant with the white men's games.

Unusual baskets were made by the Klickitat tribe, Indians who

lived along the cascades of the Columbia and were sometimes called the Iroquois of the Northwest. They were very warlike and hostile, and a constant menace to travelers and traders. Their baskets were durable and tough, so made to withstand the hard life and constant travel of the tribe. The material was usually spruce and cedar roots, soaked sometimes for months to render them pliable.

The Aleuts of the northern coasts made baskets of very fine grass with a finish like tapestry.

Delicate workmanship, good shape and artistic ornamentation characterize the baskets made by the Tlinket Indians of Southern Alaska. A typical feature is the false embroidery in grasses and plant stems, the effect being produced by working the design halfway through the basket, giving a varied effect on the outside, while the inside is plain or banded.

These are the principal types of baskets represented in the museum collection, although there are individual specimens from other tribes and districts.

American Indian and Alaskan Gallery

Bead Work of Various Tribes—Totem Poles—Indian Carvings—Alaskan Kayaks—Dress of Warriors—Drums —War Bonnets—Work of California Indians—Stone Relics From Mounds.

Comanche war bonnets and Alaskan kayak paddles, Pawnee beadwork and Catalina island stone mortars, war drums from the plains and a totem pole from Wrangel are exhibited side by side in the comprehensive and valuable collection of work done by the native tribes of North America. Particularly complete is the representation of California Indian work, both ancient and modern, and there is an excellent display of Alaskan material. Through the donation of several large collections made by private individuals, the work of the plains Indians and the tribes from farther east is also available for contrast with the handiwork of the Western natives.

The Alaskan collection has been largely augmented by the gifts of sea captains and sailors who visited that far northern country and brought back with them specimens of native work. A large number of articles were contributed by Peter Wellnitz of Sausalito, who obtained them from the sailors of the Gjoa, Amundsen's sloop, that made the Northwest Passage. Arriving in San Francisco in 1908, the Gjoa lay for two weeks at Sausalito, and the sailors, who had profited by their expedition through the far north to gather a miscellaneous collection of native articles, eagerly traded them for the products of civilization. Native kayaks and paddles, weapons, cooking utensils, wearing apparel woven from Arctic moss and made from skins and pelts, ornaments carved from the teeth of polar bears, walrus tusks and the bones of the whale and seal, mineral specimens and many other articles eventually reached the museum in this way.

The Alaskan natives are noted for their carvings, particularly in the yellowish ivory of the north. Many of their smaller household utensils are carved from walrus tusks or seal bones, and their work, while crude artistically, is unique and interesting.

One of the features of the Alaskan exhibit is the totem pole which was brought from Wrangel and secretly taken from the country because of the reluctance of the natives to allow their tribal treasures to leave the country. The pole stands eighteen feet high and is three feet thick at the base, a solid cedar block weighing about a ton. At the base is a shark's head, above that a bear sitting on his haunches and holding a man, head downward; still higher a whale, with an eagle topping the whole. According to Alexander Badlam, an authority on Alaskan lore, the totem indicated the tribe. The Alaskans were divided into five nations, and these were sub-divided into tribes with the families as the final subdivision. Each family possessed a special badge in the form of an animal or bird, and the combination of badges on the totem pole formed a system corresponding to the quartering of arms in European heraldry. Tribal rule forbade inter-

marriage between persons having the same badge; a bear might marry an eagle, but marriage between two bears was forbidden, thus providing for the maintenance of family strength as well as serving the ends of tribal alliance.

The general collection of Alaskan material covers every phase of family and tribal life. The display includes many native costumes, parkas of fur, skin and one made of the breasts of wild fowl; fur boots; weapons of all descriptions, such as bows and arrows, spears, clubs, especially those for seal killing; household utensils and implements made of stone, wood or ivory; knives, adzes, fishing material, harpoons, sleigh runners, dog harness, ornaments, pipes, combs, snuff boxes, dishes, spoons, charms, buttons, darts, etc.

Several typical Alaskan kayaks illustrate the method of navigation used by the northern tribes.

Particularly interesting is the collection of beadwork representative of many American Indian tribes. There are specimens of work done by members of the Nez Perce, Sioux, Shoshone, Pawnee, Pah-Ute or Piute Dakota, Crow, Sac-Fox, Apache, Arapahoe, Comanche and other tribes, showing the characteristic work of each section of the country.

Indian beadworkers did more than merely arranging the beads in a design pleasing to the eye, for, like the designs of Indian basketry, the bead patterns tell a story easily understandable to those who have studied the symbols. The owner's name, particular exploits, family history or other details were often worked into the beads of an armlet or necklace.

Some years ago the museum was fortunate enough to obtain the assistance of Joseph P. Myers, a half-breed Piute, who was then serving as a private in the Hospital Corps of the Army and was stationed at San Francisco. Myers, whose native name is given in museum records as Shokokum Muzzi, was familiar with the symbols of the Piutes and other tribes, and translated a number of the designs.

An armlet of blue, gold and pink beads, for example, informs the expert that it was the property of a young Piute squaw, the belle of her tribe and a coquette who numbered many suitors among the Piute bucks. A heavy black bead necklace belonged to an Indian prophetess who acted as principal mourner at the funerals of chiefs, and added beads to her necklace to commemorate these occasions. Another bit of beadwork belonged to a young warrior, moderately distinguished in battle, who had been given his name because of his mother's dream of a fight between two gigantic fish.

Numerous articles of native wearing apparel are included in the collection, notably a beautiful and very valuable squaw's costume, representative of Piute work. It is made of the finest dressed deerskin, heavily embroidered with beads and quills.

A Comanche war shirt of buckskin ornamented with scalp locks has an interesting history. It was once the property of a Comanche warrior whose prowess in battle may be judged from the number of the adornments on his war shirt. Experience of the white man's ways, however, induced a change of heart, and the garment was sold to G. W. Ingalls, an active worker among the Indians, as evidence that the one-time warrior contemplated a peaceful life. A few years later the former fighter was living on his own little farm in a house built after the fashion of the whites and on the road to becoming a prosperous farmer.

A Nez Perce medicine or war drum is a similar symbol of the giving up of old ways. The owner of the drum was once the chief

of his tribe, and the sound of this drum has doubtless more than once been the prelude to a departure on the war path. Converted to the religion and ways of the white man, the chief presented the drum to Ingalls as something for which he had no further use.

Of war relics, drums, war bonnets, bows and arrows, spears and other articles, there are many. Scalp locks dangle from spear handles and from the war drums, suggesting the dangers of frontier days, when hostile Indians were to be anticipated at any moment. Lying peacefully in one case is a tomahawk, the steel blade of which suggests early French origin. It was once the property of a Comanche warrior who boasted of having slain fifteen whites.

Turning to the work of the California Indians, the visitor to the museum will find a splendidly representative collection, including stone work, pottery, beadwork, weapons, household utensils, ornaments, ceremonial objects, costumes and many other objects. The articles are arranged by districts, affording an opportunity for comparison between the work of the natives from different parts of the State.

California's first factory is represented by examples of its products. Many years before the first Spaniard set foot on California soil, a flourishing industry was located on Catalina island, off the shore of Southern California. Here was the headquarters for the manufacture of the articles of stone used by the California tribes. Mortars, pestles, bowls of all sizes, curiously shaped stones for various uses, these were made by the Catalina island Indians and found their way into many sections of the State. The island was particularly rich in the variety of stone used for these articles.

Vast numbers of articles of stone have been credited to the Catalina island workers. Bowls ranging in size from the diameter of a thimble to that of a washtub have been found, as well as many other objects chipped bit by bit from the easily worked stone.

These stone objects are commonly found in burial mounds, although many have been discovered at the site of ancient Indian villages. The Indian custom of placing articles of daily use in the tomb with their dead has led to the preservation of many interesting objects in good condition. Many have been unearthed in the neighborhood of San Francisco; one of the largest and most richly equipped mounds in the State was found not many years ago near Point Richmond.

The ceremonial practices of the Indians are pictured by the exhibits which have to do with their religious observances. Chief among these are the charm stones which date back to a period of almost forgotten antiquity. So ancient are they that the Indians found in California by the whites knew nothing of their origin except that the stones were found by them already worked into shape. They were doubtless made by a race which preceded these Indians and which has been lost in the mists of time. Although the present tribes are ignorant of the source of the stones, they are deeply superstitious regarding them, and before the influence of the white man became prevalent, the Indians used these ancient objects as charms to avert danger or bring benefits.

The charm stones used by the San Buenaventura Indians are characteristic of the class. Native superstition declares that the stones make their presence known by standing up on end when the individual, destined by fate to possess them, draws near in the measures of the ceremonial dance.

Students of the Indian customs describe the ceremony used in connection with the charm stones as follows: Twelve charm stones,

usually small, rudely carved or shaped stones, were placed in a circle with a tucait or special piece of stone, usually quartzite, in the center. Down from the wild duck and red meal were sprinkled over the stones, and red ochre scattered over all. About these stones the Indians danced while three old men played sacred rattles. The ceremony was intended to accomplish various objects, to cure the sick, to ward off evil spirits, to put out forest fires, to bring rain, to charm fish into the streams, to drive deer to the favorite hunting grounds, or to bring success in battle.

The collection of miscellaneous native articles in the museum is very complete. Representing all phases of daily life of the tribes, it includes arrow points, hammer stones, weapons, skinners, cooking utensils, wampum, rings, spear points, pestles and mortars, ornaments, gambling chips, head bands, pouches, awls used in basket weaving, bracelets and necklaces, ceremonial objects, spoons, hide beaters, bows and arrows, rattles used by medicine men, costumes, headdresses, hair combs, fish bags, fish hooks, stone axes, ollas and other pottery, looms for blanket weaving papoose cradles, peace pipes, Alaskan carvings, throwing sticks, blankets, ceremonial dance dresses, canoes and, indeed, almost every conceivable object pertaining to native life.

Among the interesting and valuable collections is the Henry MacLean Martin collection, valued at $25,000, and representing the work of the Northern Plains Indians, principally Sioux and Crow. The Daggett collection, made by John Daggett, former superintendent of the mint in San Francisco, is unique in that it represents the history and life of a single and little-known tribe, the Cahrocs, whose home has been along the Klamath river in Northwest California. The tribe now consists of a small group of natives, but was once powerful. In the collection are examples of every detail of tribal life, making possible a complete and exhaustive study of this particular group.

A Gallery of the South Seas

War Material—Relics of Cannibalism—Costumes of Natives of the Philippines and Other Islands—Ancient Stone Implements.

Grouped under the general classification of exhibits from the South seas are objects of many types, representing the native life of the Philippines, Hawaii, New Zealand, Australia, Tahiti, the New Hebrides, the many islands of the southern archipelago, and also the collection from East and South Africa. The collection includes articles of daily life, ornaments, war material, pottery, costumes and similar objects.

Perhaps the most interesting object of the South seas display, if somewhat grewsome, is the huge cannibal bowl from the Solomon Islands. This great bowl, carved from wood, and about three feet in diameter, was used at the cannibal feasts of old to receive the body of the victim for convenience in carving. Its worn and polished state suggests that it has had considerable use.

The warlike nature of the South seas natives is indicated by the large supply of weapons and war material on exhibit. War clubs, arrows, shields, spears with shark tooth points, rude knives, all suggest many a life and death struggle between tribes, as well as desperate resistance to the encroaching white men.

From the Caroline Islands have been brought many of the shark tooth spears and daggers, and the small size of some of these indicates that the women of the Caroline Islands tribes were no whit behind their men in warlike energy, for these lighter and smaller weapons were made for feminine hands to wield.

The virulent poison used by the natives adds to the threat of these weapons, particularly the arrows. During the installation of this exhibit the curator and his assistants wore heavy gloves, but even with this precaution accidental scratches produced painful effects.

One of the interesting war spears in the collection was a royal weapon from the Island of Malaita, Solomon Islands. The workmanship and unusual length of the spear denote its royal ownership, as the higher the tribal rank possessed by a warrior, the longer and more ornate was his battle spear. The women of the Solomon Islands are credited with being the official armorers of the tribe.

Human bones were often used in the workmanship of these weapons. A piece of bone from a human forearm fastened to the end of a spear handle indicated that the owner had killed his man in hand-to-hand fight, and the broad shin bones of unlucky natives who had met sudden and violent death were found most convenient for the manufacture of spear blades.

A more modern weapon, at least in time of use, is the Moro sword captured at the battle of Bahadu, in August, 1917, when the last survivors of a band of head hunters were exterminated in a cave where they had gathered to offer final resistance to the Americans. The sword, which is of a plain and unpretentious design that suggests its

strictly business intentions, has a roughly carved wooden handle and a heavy beaten steel blade. It is said to be two and a half centuries old and was regarded by the natives as a talisman for victory. Its ownership has been assigned to chiefs and sultans of Moro tribes. The sword was brought home from Bahadu by Corporal Leland Beveridge, who presented it to the museum.

War implements from South Africa and weapons, drums, shields, spears and a Mohammedan battle-flag from the Arab tribes of East Africa complete this display of war material.

More peaceful pursuits are indicated by the native jewelry and ornaments. Shells were largely used for necklaces and other forms of jewelry by the island natives. From the New Zealand tribes come certain interesting tiki gods, or charms, carved from jade and worn by Maori chiefs. They are declared to date back to the sixteenth and seventeenth centuries.

Costumes of various descriptions are found in this collection, including the characteristic dancing dresses of the South seas, feather cloaks, headdresses and other articles. Particularly interesting and valuable is the wonderful kiwi robe, made of feathers of the extinct kiwi bird, and worn by Chief Mita Tapopoki of the Maori Arawa tribe. Seventy years are said to have gone to the making of this great cloak, covered with the tiny feathers of the bird, for each bird furnished only a few feathers and thousands are used in the garment. The cloak was worn at the coronation of Edward and the diamond jubilee of Victoria, when chiefs of distant tribes gathered to pay homage.

Lying peacefully in its place in one of the wall cases is an object identified as a battle ax. In reality it served a somewhat grimmer purpose, as this weapon with its clumsy wooden handle and flat blade of jadeite, was originally used as a beheading ax.

A curious relic is a natural bell of stone, found in a wood near the town of Inarajan, Guam. According to native legend this bell was struck by a giant to call his people together.

Adorning the walls of this gallery are many spears, darts, shields and knives used by the natives of the South seas. This collection is one of the many purchased by Mr. de Young for the Museum.

A very valuable collection, presented by Sergeant H. G Hornbostel, United States marine corps, consists of 580 specimens of ancient stone implements from the island of Guam, gathered during Sergeant Hornbostel's service there. It is regarded as the most complete collection of the kind in the United States, and is both larger and more representative than the collection previously presented by the sergeant to the New York Natural History Museum.

The specimens were found in old ruins scattered over the island and were gathered with great difficulty because of the reluctance of the natives to touch the relics of their ancestors. The superstitions of the Chamorros were finally allayed by the promise of liberal reward. Sergeant Hornbostel found that cans of salmon offered in exchange for relics produced particularly good results.

One of the curious exhibits in the collection of African material is the shell mat, once the property of a rich Soudanese chieftain. The mat, about six feet long and four feet wide, is ornamented with a close pattern of cowrie shells, used as currency by the natives. The quantity of shells used in the decoration is an indication of the wealth of the owner.

Arab wedding ornaments, jewelry, weapons, articles of dress and other objects complete the collection.

Gallery of Antiquities

Egyptian and Pompeian Gallery—Mummies and Relics of Antiquity — Canopic Vases — Mummified Cats — Tomb Figures—Deciphering of Hieroglyphics—Jewelry—Seals —Herculaneum, Etruscan, Assyrian and Other Objects.

Picturing the civilization of long-dead centuries are the exhibits gathered in the room known as the Egyptian and Pompeian gallery and devoted to originals and reproductions of treasures from the ancient cities of Egypt, Greece, Etruria and other lands of history. In addition to a large number of originals, the exhibit includes careful and accurate reproductions of pottery, implements, objects of art, coins, such famous objects as the Rosetta Stone, and other articles.

At the doorway of the gallery stands a black marble reproduction of the famous Bull of Nineveh, the original of which is in the British Museum. There were once two of these guardians of the gate, but the second was broken in the earthquake of 1906.

Austen H. Leyard, a well-known explorer and archaeologist, discovered the originals in 1846 in excavations at Nineveh. The bulls belonged to the period of Assurbanapal, who began his reign about 885 B. C., and stood at the gates of the temple. In the inscription the bulls are called "sedu" or spirits, and are declared to protect the comings and goings of the King and to exclude all evil.

A curious feature about the bull is that he possesses five legs, so arranged that whether the statue is viewed from the front or the side the bull displays four legs, all in the plainest possible view. The bull has an elaborate conventional neck adornment, and the background is covered with carvings and inscriptions.

The mummy collection includes two wrapped mummies and several fragments, showing the method of wrapping. Priest and priestess lie side by side in their glass case—Thoth, high priest of the Temple of Isis at Ekhmin, and Hatason, priestess and vestal virgin from the Temple of Amen-Ra at Lycopolis. Thoth had already been placed in his sarcophagus when Hatason was serving in the Temple of Amen-Ra, for his mummy has been estimated to be more than thirty centuries old. Inscriptions on Hatason's mummy-case assign her to the dynasty of Ptolemy IV, about 222 B. C. "Rest she in the justice of Osiris" is the memorial inscription on her coffin.

Because of their belief that the soul, after passing through centuries of existence in other bodies at last returned to its human body for another life, the Egyptians practiced the art of embalming their dead with the view of keeping the body intact for the soul's return. Archaeologists have declared that mummifying was in vogue from 2000 B. C. to 700 A. D. and have ventured the belief that millions of bodies were thus prepared. Thousands of these mummied bodies did not survive the centuries; careful placing in tombs of living rock was only for the wealthy, and the bodies of the poor, roughly mummified, were thrown into mummy pits without identifying inscriptions. Many

mummies have already been taken from tombs; how many more the age-old sands of Egypt hold no one can tell.

Mummy-preparing was a recognized industry in ancient Egypt. Every city had its establishment where bodies were received and embalmed and where the embalmers, gilders, mummy-case makers, carvers, scribes, priests and other workmen formed a colony of their own.

The bandages in which the bodies were wrapped after the viscera had been removed and spices and preserving material placed in the body were always of linen, the texture varying with the rank of the deceased. Each finger and toe was first separately wrapped, then the arms and legs were swathed, and finally the whole body was wrapped tightly in the strips of linen from three to four inches wide. From 700 to 1250 yards of bandages have been taken from mummies that have been unwrapped.

The bandaged mummy was first placed in a coffin of wood, usually cedar or sycamore, and the coffin was placed in a sarcophagus, there sometimes being several enclosing coffins before the final outer sarcophagus was reached. On the lid of the wooden mummy case was often painted a portrait of the man or woman within, and inscriptions were also placed there. Mummies have been found on which bandages were marked with the name of the dead and sometimes the name and regnal year of the reigning king, doubtless to prevent mistakes in identity.

Mummification of animals was extensively practiced. Mummies of animals were often placed in the tomb with human mummies to insure the presence of favorite dogs or cats with their owners in later lives. Sacred animals also were mummified. Many Egyptian cities had their particular animal protector, a cat or a crocodile or some other animal or living creature. These animals were held sacred and cared for at death as if they had been human beings. The sacred cats of Bubastes are well-known examples of this custom.

Several mummies of animals are in the museum cases, some fairly well identified, and others such shapeless little bundles that it is only a guess that they may have been cats.

Supplementing the mummy collection is an excellent collection of canopic vases, funeral figures and tomb property, all originals. Canopic vases were the containers in which the viscera of the bodies transformed into mummies were placed, and the vases placed in the tomb with the mummy. The examples in the museum are of alabaster, stone and other materials, and are lavishly carved.

The funeral figures are of clay, wood, glazed enamel or pottery. They were placed in the tombs, and frequently represent attendants to wait upon the dead man.

A large black basalt reproduction of a carved sarcophagus lid shows hieroglyphic inscriptions.

Probably the most important discovery in Egyptian archaeology was made in 1799, when French soldiers, commanded by Bonchard, an artillery officer, were digging for a redoubt near the village of Rosetta on the Nile delta, and unearthed what later became known as the Rosetta Stone. The original is one of the chief treasures of the Egyptian division of the British Museum. The Memorial Museum owns a reproduction.

About 190 B. C. instructions were given to stone carvers to prepare a special tablet to be erected in honor of Ptolemy Epiphanes, the

reigning monarch. In order that all might read of the glories of Ptolemy Epiphanes, the workmen were ordered to carve the inscription in three languages; hieroglyphics, or the picture writing used on monuments; the demotic, enchorial, or popular Egyptian writing, which was used for decrees, public documents, contracts and general transactions, and lastly, that foreigners might read and admire, in Greek.

It was the Greek that gave the clue to the inscription in hieroglyphics, hitherto utterly untranslatable in spite of the efforts of scholars. It was assumed that the inscription was in triplicate, but even this was merely a beginning of the task. The scholars knew what the entire hieroglyphic inscription meant, but they could not tell one word from another.

De Sacy, a French archaeologist, was the first to make progress. Using the cipher reading method dear to the writer of mystery stories, he searched the rows of hieroglyphs for recurring symbols. He found these in numbers, but failed to solve the problem. His difficulty, it was learned in later years, was his failure to guess that the hieroglyphic writing used phonetics as well as symbols and that the enchorial system also made use of symbols, as well as letters.

Not until 1814 were words of the inscription translated definitely. Then Dr. Young again took up De Sacy's method and identified a small group of characters, as "and." Another recurring group, by comparison with the Greek, he decided meant "king." "Ptolemy" and "Egypt" were located in the same way.

The work of translation was completed in 1824 by Champallion and immediately the treasures of the hieroglyphic inscriptions on thousands of monuments and documents were thrown open. With the aid of the Rosetta Stone, the wonderful Book of the Dead was interpreted, the book which was found in the tombs of the Kings of Thebes, and which sets forth the entire Egyptian system of funeral ceremonies, beliefs as to the future and other illuminating facts about the ancient nation.

Ptolemy Epiphanes, in the Rosetta Stone inscription, is styled "King of Upper and Lower Egypt, son of the Gods Philopatores, approved by Pthah, to whom Ra has given victory, a living image of Amun, son of Ra, Ptolemy immortal, beloved by Pthah, God. Epiphanes most gracious."

The preamble mentions with gratitude the services of the King, or rather, of his wise minister, Aristomenes, who, one imagines, had something to do with the affair of the tablet; and the enactment orders that the statue of the King shall be worshiped in every temple of the land and be carried in processions with those of the other gods of the country. Lastly, the decree is to be carved at the foot of every statue of the King in sacred, common and Greek writing.

Perhaps these super-regal honors were not too much for the man through whom, although he never knew it, the storehouse of ancient Egyptian lore was to be opened to later generations.

The divinities of Egypt are largely represented in the collection through the many statues of clay, wood, alabaster, enamel or other materials. Most frequent among these statuettes are those of Osiris, regarded as the prince of good, the creator, the foe of all evil and the god of the Nile, who engaged in constant battle with his brother or son, Set, who was the god of evil, darkness and the desert. Isis, the sister, wife and female counterpart of Osiris, and the mother of Horus, is also often found in statuettes. She is usually represented with the solar disk and cow's horns on her head and holding a lotus scepter. Isis is the favorite divinity or protector of mystics, and the inscriptions fre-

quently found on her statue assuredly qualify her for the place. One inscription, often found, reads: "I am that which is, has and shall be. My veil no one has lifted. The fruit I bore was the Sun." Isis watched over the birth of children and presided over all good.

Bast, the cat-headed goddess of Bubastis, and Thoth, the ibis-headed, are examples of popular divinities. Thousands of little cat-headed images of Bast were sold at Bubastis, where fortunate cats lived in an earthly paradise, worshiped as divinities and treated with vast reverence.

Many of the images of gods, canopic vases and other articles in the exhibit were bought by Mr. de Young from the Cairo Museum, where duplicates of articles already in the museum collection are sold. Mr. de Young had the advantage of advice from Stone Pasha, a former San Francisco man who happened to be holding an official position in Egypt when Mr. de Young visited Cairo.

An odd little story is told about this purchase. Stone Pasha knew that the authorities were not always as accurate as they should be in certifying the authenticity of relics, so he arranged with Mr. de Young, before visiting the museum, that he would guide the choice. Not wishing to place himself in an unfavorable light with the Egyptians and yet desiring to assist his friend, Stone Pasha agreed with Mr. de Young upon a system of signals whereby a certain phrase was to mean that the article in question was good and worth buying and certain others meant that it was dubious.

There is also a case of interesting Egyptian jewelry, necklets, armlets, bangles, rings and amulets, as well as several excellent scarabs. The genuine scarab is not, as often thought, the beetle it resembles, but it is an imitation of the beetle carved in feldspar, quartz, serpentine, hematite or some other semi-precious substance. Scarabs were used as amulets and as the emblem of the principal male divinities, and also as ornaments and in rings. Inscribed scarabs were placed over the hearts of mummies and those without inscription sometimes inside the bodies, the object of the charm being to preserve the heart, in which the soul was supposed to seek refuge after death. Scarabs for rings were often carved from precious stones or made of white soapstone coated with blue or green glaze, this being the best-known color.

The case of engraved seals is one of the most valuable exhibits of the room. The ancient peoples considered each gem as the representative of some spiritual, moral or physical power and believed that the presiding genius of a man's fate could be carried around with him in the shape of a gem, usually his engraved signet. It was an ancestor of the lucky stone belief; a man who claimed a certain jewel as his protector would have his signet or seal carved on that gem so that he might always carry it with him.

In Egypt the punishment for counterfeiting seals was the loss of both hands, so carefully did the ancients guard against forgery. In modern Persia the seal cutter keeps a register of all seals he makes and the punishment for forgery is death.

The earliest form of seals were oblong or cylindrical, gradually developing into the small circular form to be worn in a ring.

The museum collection represents Assyrian, Hittite, Persian, Oriental and Babylonian seals, dating back for thousands of years and showing all shapes and many kinds of materials. Mr. de Young purchased the collection from an Eastern man who had spent years gathering it.

Roman, Greek and Egyptian lamps and tear bottles fill another case. The lamps are the familiar boat-shaped form or round pottery affairs, designed to hold a wick.

Tear bottles are reminiscent of the grief of the ancients for departed relatives, for it was the custom for mourners to catch their tears in these odd-shaped little bottles as tangible evidence of their grief.

The pottery collection contains both originals and reproductions. The originals include a large number of fine examples of Graeco-Roman pottery of the early centuries and some later Greek specimens. One particularly good vase of the sixth century has been compared with the famous Portland vase for beauty of shape and design. The Graeco-Roman pottery is usually of a vermilion tinge, with spirited designs painted in black.

Among the reproductions are examples of Pompeian workmanship, copies of vases, bowls and jugs found in the ruins of the ancient city, showing characteristic designs and color. Pompeii is also represented by a large number of reproductions of bronzes, instruments and other objects.

Pompeii, the storehouse of treasure of the period, was a flourishing provincial town, situated at the foot of Mount Vesuvius, on the Bay of Naples. It was a summer resort of the time, containing the suburban villas of wealthy Romans, where they kept many objects of art. There were no large public buildings, but an unusual number of handsome private homes, richly furnished.

The eruption of Mount Vesuvius in 79 A. D. overwhelmed the city and the neighboring town of Herculaneum. Novels, from Bulwer-Lytton's story on down, and many other books have made the modern reader familiar with the details of that catastrophe. Excavators meet different conditions in the two towns, for Pompeii was buried principally under ashes, while floods of lava poured over Herculaneum. The ashes have hardened into stone in the passage of centuries, but even so, excavation at Pompeii is easier than at Herculaneum.

Owing to topographical changes, the site of the city was lost and it was not relocated until 1748, when an accidental discovery revealed its existence under the lava and ashes. Systematic excavation was started in 1755 and was carried on for only a short period. Occasional explorations were made during the century that followed, but careful and scientific work was not done until the middle of the nineteenth century, under the direction of Signor Fiorelli. In the '70s the discovery of rare objects reached proportions that interested the world.

All Pompeian bronzes that leave Italy are reproductions. The originals are treasured in the Royal Museum at Naples as the property of the Italian Government and cannot be purchased at any price. However, the firm of J. Chiurazzi & Sons of Naples has had for some ten years a Government license to make replicas of the antique pieces, and their reproductions are somewhat more than mere copies, for they use the same method of casting as that followed by the ancient artists.

The secret of Roman bronze casting was lost after the early years of the Christian era until it was rediscovered by Benvenuto Cellini in the sixteenth century. The Roman artists made their models in wax, permitting the most delicate designs to be created. The wax was then covered with successive layers of plaster or very fine clay, until the coating was strong enough to serve as a mold. The object was then heated, the wax melted and was drained off through a hole left for the purpose, and molten bronze was poured into the hole to replace the wax. Obviously the bronze casting could only be reached by breaking

the plaster mold, and since the wax model had already been destroyed, it was entirely out of the question to make duplicates.

Modern artists have made use of this method; Gustave Dore used it in creating the giant bronze vase that stands in the Memorial Museum.

The Chiurazzis have not only adopted the Roman method of bronze casting, but have discovered a method of reproducing the patina, or glossy finish on the bronze pieces. The bronzes dug up from the ruins of Pompeii are tinted a powdery green, with metallic shades, due to the action of chemicals in the ashes. This tint is faithfully reproduced in the castings. Bronzes from Herculaneum, which were covered with lava instead of ashes, are a smooth metallic black in color.

An example of work from Herculaneum is the beautiful Chelidon jar in the museum collection. This differs from other pieces in that the original was not cast, but hammered, decorations and all, from solid bronze and adorned with chasing done with a chisel. Arabesques in a broad band encircle the vase just below the rim, and winged heads form the attachments for the double handles.

A typical Pompeian piece is the magnificent candelabrum from the House of Diomede—a villa that once belonged to a wealthy citizen named Marcus Diomede, who evidently was a connoisseur of art, for quantities of beautiful objects have been taken from his house. The candelabrum was designed to hold lamps. It is a standard, four feet tall, from the four branches of which lamps are hung by chains. These lamps were designed for the burning of oil. Each is double, with a hole at either end for the wick, and a third hole through which the oil was poured. This hole was closed with a bronze thimble. A design of grape vines and leaves is done in relief on the surface of the base, on which stand small figures representing Cupid riding on a tiger and an altar on which flames are rising.

Two beautiful tripods are included among the bronzes. One was found in the Temple of Isis at Pompeii—the worship of this Egyptian deity having spread extensively through the Northern Mediterranean countries at the time Pompeii flourished—and the other coming from the House of Julio Felix.

The temple tripod, used as a sacrificial dish, is a large circular bowl, very shallow, with garlands in relief about its edge. It is supported by three winged figures. The Felix tripod is also supported by figures with their arms outstretched, and is elaborate in design.

Another type of pottery shown is the Etruscan, found in ancient Etruria, on the Mediterranean, which corresponds to modern Tuscany. Etruria is one of the few countries of antiquity which still guards its secrets. The Etruscan language has never been fully interpreted and many inscriptions remain unread. A few clews to the mystery have been afforded by the discovery of several vases bearing the Etruscan alphabet, representing the early forms of the twenty-two Phoenician letters arranged in Semitic order, but no Rosetta Stone has yet been discovered for the benefit of archaeologists who puzzle over the problem.

Etruscan pottery is not of the best type, for this nation appears to have imported its best pottery from Greece. The people were, however, experts in metal work and seem to have tried to adapt shapes and designs suitable for metals to their work in clay.

Two wall cases in this gallery hold an interesting collection of casts made from the Graeco-Roman gems in the British Museum. The exhibit is a comprehensive collection of specimens of carved gems of the

various periods of antiquity, showing the fine cameo and intaglio carvings of portrait heads, mythological subjects and other designs.

Bronze reproductions of architectural and surgical instruments used by professional men of ancient Greece and Rome are also shown, and there is a similar collection of Egyptian musical instruments.

Prominent among the exhibits is a black basalt reproduction of an Assyrian obelisk, accredited to the period of Shalmaneser II, 823 B. C., and showing the angular Assyrian relief modeling and carving.

Three plaster reproductions of contrasting friezes are on the walls of the gallery, one of the Parthenon frieze, one a fragment of an Assyrian relief, and one a bit of frieze from the organ screen in the Duomo, Florence. The Parthenon frieze depicts, in addition to figures, the sacred treasures which were used in Panathenaic festivals at Athens and kept at the Parthenon. Built in 438 B. C., this famous structure stands on the Acropolis overlooking Athens, and while it was dedicated to Athene, it did not serve as a temple, but rather as a storehouse for the festival treasures.

Papyrus documents, fragments of sculpture, jewelry and miscellaneous exhibits of a wide variety complete the display in the gallery devoted to the world of antiquity.

The Ecclesiastical Gallery

Church Furniture—Tabernacles—Carvings—Lamps—Paintings Used as Altar Pieces—Diptyches and Triptyches—Souvenirs of Religious Events—Wrought Iron Work—Old Missals—Antique Crucifixes.

With the opening of the new unit, the wealth of church material that for years was housed in a small room of the old building has been properly displayed in a larger gallery, where its value can, for the first time, be genuinely appreciated. The museum owns some exceedingly valuable ecclesiastical material, and other excellent pieces are there as loans.

The most striking object in the gallery is the large tabernacle from a church of Cadiz, Spain. It is a Renaissance piece, elaborately gilded, and supported by cherub figures.

At the opposite end of the room stand two very old pieces of church furniture, a Flemish chalice cabinet of the middle sixteenth century, decorated with a quaintly carved panel representing Abraham offering up Isaac, and a fourteenth century shrine, very elaborately hand carved and gilded and surmounted with the heraldic arms of Charles V of France. In the shrine stands a wooden figure of the Virgin, the robes gilded and painted. The detail carving on the panels and doors of the shrine is particularly interesting.

A pair of doors from the Convent of Ecija, Spain, are in the gallery. These are made of Madeira santo, or "holy wood," and the arms of the Duke Osema are carved on the lower panels.

Hung from the ceiling are several antique church lamps of beautifully wrought iron or bronze.

Above the wall cases are a number of paintings, both originals and reproductions. The pictures include a copy by William Fisher of Titian's "Marriage of St. Catherine"; an original by Carlo Maratti (1625-1713), "The Lord's Sorrow"; a copy of "The Beheading of St. John" by Cristoforo Allor, a painter of the sixteenth century Florentine school; a copy of the Murillo Madonna in the Galleria Corsini, Rome; an original, "Jesus in the Wilderness," by J. Bronzini; three very interesting old paintings from Mexico, one representing St. Ignatius, founder of the Jesuits; one, St. Anthony of Padua, and the third a really excellent painting of a Franciscan friar, dark with age, and noteworthy for its interesting lighting, a strong gleam falling on the face and hand, leaving the rest of the figure in darkness.

The collection is particularly rich in wood carvings of the Middle Ages. Among the interesting specimens are reliefs, painted and gilded, dating to the sixteenth century, representing such scenes as the Nativity, the birth of Mary, St. Peter and other saints; a sixteenth century St. John from Spain, elaborately gilded; a quaint old sixteenth century "Ecce Homo" from an old church at Lille, now destroyed; a gilded and painted wood carving from a sixteenth century chapel at Avignon, France; a seventeenth century altar piece, representing the

East Indian teakwood settee. Carvings represent life of Buddha. Exact duplicate of the one presented to King Edward VII on his visit to India. Furniture Gallery.

Sacred Heart surrounded by the thorn wreath, with four carved heads and two carved figures, taken from the famous Church of St. Benedict, Saeckan-Steirmark, Tyrol; two groups of angels, seventeenth century work, formerly in the House of Justice of the city of Wurtzburg, Germany; beautifully carved Stations of the Cross; many smaller reliefs and altar pieces, and a large number of figures of saints and apostles, the latter figures particularly good.

Several plaster reproductions of well-known carvings and statues are included, such as two figures of saints from niches in the wall of Rheims Cathedral, and the quaintly individual little figures of the monks that march about the tombs of the dukes of Burgundy at Dijon.

An odd little figure is the elaborately dressed wax doll that occupies a special case. When Princess Maria Louisa of Austria was born, December 12, 1791, this and similar figures were placed in the churches to suggest to the people to pray for the health and welfare of the little Princess. The doll represents a child, gowned in the massive silver brocade and lace court costume of the period.

Several beautiful examples of mediaeval diptyches and triptyches occupy space in one of the wall cases. These are of varied materials, carved wood, silver, enamel or ivory, and are wonderfully artistic. One particularly beautiful triptych has the Virgin and Child in the central panel, with adoring figures kneeling on the outside panels. The work is in ivory, delicately carved and illuminated with color. Another interesting triptych is in blue Limoges enamel, and still another is of hammered silver.

This case also contains the valuable and interesting Porta Santa bricks, yellow clay bricks stamped with inscriptions and decoration. The chief of these bricks is from the Porta Santa, or Holy Door, at St. Peter's, Rome, and is stamped "Year of the Jubilee, 1775," also bearing the tiara and keys, the symbol of papal authority. Originally the Porta Santa was opened every hundred years for the formal entrance of the Pope, but about the time of Dante the Pope ordained that the ceremony should take place every quarter century. The custom continued until 1825, when, owing to the rupture between the Italian Government and the Vatican, it was discontinued until 1900.

When the time for opening the door arrives, the Pope, with the Cardinals, the Vatican Guards and his entire retinue, approaches the door by the stairs known as Carlo Magno (Charlemagne), which connect with his private apartments from outside the church. He strikes the door three times with a silver hammer, and, through a mechanical contrivance, the bricks then in place fall to the ground. The Pope thereupon enters the church with his suite.

After a year the door is again bricked up with formal ceremonies, the Pope laying the first brick, which is stamped with the year and the papal coat of arms. The museum brick, being stamped 1775, is therefore the brick which was put in place that year and removed in 1800.

Thousands of pilgrims visit Rome at this time to win indulgences by passing through the Porta Santa. Records of 1900 show that 800,000 pilgrims passed through the door during the year it stood open.

Similar ceremonies are carried out at the others of the seven basilica in Rome, the Cardinal to whom is assigned the title and protectorate of the basilica officiating at the ceremony. The museum possesses a brick from the Basilica of San Giovanni, which is stamped with the coat of arms and name of Cardinal Julius Maria de Somalia, protectorate of the Basilica of San Giovanni, under the pontificate of Pope Leo XII, 1825.

Other papal relics possessed by the museum include a slipper of red leather worn by Pope Pius IX, which is certified as authentic by the notarial seal attached and a zuchetta or cap of white silk worn by Pope Leo XIII and presented to Count Peter Donahue of the Papal Guard.

These two relics and a beautiful chalice cover of red silk, embroidered in gold thread, from the Cathedral of Palermo, Sicily, are placed in a case, which also contains an unusually fine exhibit of ecclesiastical embroideries, stoles, altar pieces, vestments and other pieces. These are practically all of mediaeval origin and are heavily embroidered in gold, silver and silk.

Many of these magnificent vestments were purchased by Mr. de Young in the famous Roman "rag market." This well known institution is not exactly what its name would indicate, but is a weekly outdoor sale, held on Thursdays in one of the great squares of Rome. Merchants set up booths and all varieties of goods are displayed, frequently of high value. It was Mr. de Young's habit during his visits to Rome to leave his carriage at the outskirts of the "rag market" and hunt through the aisles of booths, returning to the carriage with armload after armload of rare materials.

Lucky chance and Mr. de Young's persistence in following up clews brought many treasures to the Museum. An example is the collection of carved figures of nine of the apostles that stand in one of the cases of this gallery. Mr. de Young overheard a chance remark in a small cafe to the effect that a barber in a certain district of Paris had some curious wooden images in his shop. Immediately he set out in search of the barber shop, located it, and there found the apostles, which the barber told him he had bought for a few francs when an old church near by had been demolished. He regarded them merely as curios and had no idea that they were rare mediaeval wood carvings.

Interesting objects in the collection are the wrought iron cemetery crosses from Germany and Ireland. These crosses have spaces in the center for a religious picture.

The collection of altar furnishings, candlesticks and similar pieces is large and valuable. Some of the brass candlesticks are particularly beautiful, and there are several antique holy water fonts, crucifixes and other objects.

In a case at the end of the room is an excellent display of illuminated pages in Latin and Hebrew. The Latin examples are largely choral leaves of parchment, setting forth the music of the Gregorian chants in the black-letter illumination of the Middle Ages. Parts of the Missal of the Mass are also shown in these beautifully illuminated parchment pages. The Hebrew examples date to the eighteenth century. One among them is a marriage certificate, dated Rome, 1817.

The documentary treasures of this collection are priceless. The collection of Bibles alone is unusually large and contains some exceedingly valuable specimens of the first days of printing. There are German, Welsh, English, Dutch, French, Spanish and Latin volumes; old family Bibles, with the family history duly filled out; a German Bible printed by Krafft in 1590; Dutch Bibles printed at Amsterdam in 1754, 1818 and other dates of the period; English Bibles of the seventeenth and early eighteenth century; a Danish Bible of 1769; historic French volumes; early American specimens, and many others.

The Spanish books represent the seventeenth and eighteenth centuries, and most of them are bound in vellum.

Among the American books are many of the quaint old moral guides of long ago, such as "Help and Guide to Christian Families," 1773; "Tracts, Entertaining, Moral and Religious," 1803; "Religions of the World," 1695, and a sermon by Joseph Lathrop, D. D., of West Springfield, Mass., occasioned by a series of remarkable inundations in the winter of 1807.

Several beautiful examples of the Koran are shown, written by hand on parchment and wonderfully illuminated in crimson and gold. East Indian prayer tablets are curious affairs that fold up like a fan.

There is a large and interesting collection of rosaries and reliquaries, including an eighteenth century reliquary found on a battlefield in Greece.

From Mexico comes a valuable collection gathered by Dr. Ernest Forbes. Among the exhibits are relics of the Inquisition, spiked collars, spiked belts, whips of heavy chain, spiked shoesoles and similar articles. In this class belongs the sixteenth century dismemberment ax, an elaborate and massive affair of chased steel shaped like a battle ax, and the "cuchillo de consolation," a knife which was used to put an end to the sufferings of the victim of torture.

Mexican also are the antique crucifixes carried by Jesuit priests when making a mission, and the milagros, or tiny silver images hung on the shrines of patron saints in gratitude for answered prayers. From Mexico came the exceedingly interesting paintings on wood and copper, heads of Christ, pictures of saints and other religious subjects, showing the importation of Spanish and Italian art into early Mexico.

An antique church bell in one of the cases was taken from a ruined Spanish church at Guadalupe, Philippine islands.

Individual objects of great interest and value are numerous and widely varied, completing a collection that invariably attracts much attention.

Art Metal Gallery

Keys, Locks, Escutcheons and Hinges—Chamberlain Keys of Gold—Door Knockers Are Elaborate—Prison Relics Tell Grim Tales—Handcuffs and Shackles.

Keys, locks, escutcheons, knockers, jewel caskets, and many other objects of wrought metal are displayed in one of the galleries of the old unit, the exhibit including several of Mr. de Young's special collections. The keys, for example, make up one of his most complete collections, and the examples, more than 200 in number, represent the best metal work of Gothic and Renaissance periods.

The elaborate locks of early days are illustrated by a large collection. Gothic and Renaissance metal workers designed their door locks for more than merely utilitarian purposes. Instead of making the lock as inconspicuous as possible, as is ordinarily the case on a modern door, unless designed by an artist, the locks were wrought into fanciful shapes with elaborate patterns of intricate metal work surrounding the working parts. They were huge affairs, compared to the present compact locks, corresponding to the giant keys which often measured many inches in length.

The general collection of locks includes many types, large and small, plain and elaborate. Historic locks in the exhibit are one taken from a door of the Bastille near the Porte St. Antoine, and antique locks from old Spanish vestment chests, treasured in the cathedrals and churches. These chest locks are especially beautiful in design on a smaller scale than the big door locks.

Other locks doubtless served to fasten palace or church doors, to keep safe royal treasures, or to seal the doors of mediaeval dungeons, for every bit of wrought metal in the exhibit has its own history, whether recorded or unknown.

With the locks, come the keys that once turned in them. The collection of keys, especially of the Gothic and Renaissance periods from the twelfth to the sixteenth century, is very complete, and, displayed in large wall cases, is easy to study.

Like other art and handicraft of the periods, the keys betray their origin; the Gothic keys are heavier and more solid and simple in design, while the Renaissance examples are elaborate and flamboyant in their intricate adornment.

An interesting case of keys contains a group of gold chamberlain keys, given by German princes to their royal chamberlains as badges of office and designed to be worn suspended about the neck of the recipient rather than put to practical use. The keys are of moderate size, elaborately designed, and surmounted by the arms of the royal patron. Among them is the key given to Count Frederick August of Brockdorff by Maximilian Joseph I of Bavaria, and keys given to their chamberlains by Elector Maximilian II of Bavaria, the king of Poland-Saxony, Grand Duke Leopold of Baden, Elector Charles Theodore of the Palatinate, a king of Bavaria, and other kings and princes.

These keys are in the museum as a result of Mr. de Young's persistence as a collector. The story of how he found them placed in the private apartments of a German dealer and purchased them after a long battle of wits with the owner, who did not wish to sell the keys, is only one of the many interesting tales that may be connected with the museum exhibits.

When mediaeval metal workers sunk the locks into the doors instead of placing them prominently, they satisfied their desire for elaboration by surrounding the keyholes with escutcheons or designs in wrought metal. A large collection of these keyhole escutcheons is in the museum, showing the beautiful art of the old-time metal workers. The escutcheons are intricately wrought in elaborate designs, and often reach large dimensions.

Similar escutcheons were designed to adorn door knobs, which projected from a background of artistic metal work instead of from the unadorned surface of the door or from plain plaques of metal. Modern door knob plates are descendants of these elaborately wrought affairs of the Middle Ages.

Door knockers were objects on which metal workers of mediaeval years spent much effort. Before the days of bells and push buttons, the door knocker was an important affair as well as an indispensable part of household equipment. The museum contains a large collection of knockers of Gothic and Renaissance origin, showing all styles from plain, substantial wrought iron to elaborate affairs of hammered brass and copper. Two historic knockers in the collection are of Spanish origin. One was taken from the palace of Aben Abez, a Moorish king in the days of the invasion of Spain, and the other from the balcony on an old house built by Charles V in 1664. This knocker is adorned with the royal coat of arms and crown.

Hinges have always attracted the attention of metal designers as objects on which it was possible to expend much effort with good results. Ancient chests and trunks almost invariably have elaborate and interesting hinges of wrought metal, frequently so large that they reach far across the lid. Many examples of antique hinges of hammered and wrought metal are in the museum, some taken from old cathedral chests, some from treasure boxes, and others from doors.

The collection of miscellaneous metal objects includes a large number of caskets, jewel boxes, candlesticks, bowls, ornamental objects, lamps and other items. The jewel caskets are especially beautiful with their intricate and attractive designs, delicately wrought in the metal.

Hammered brass work, characteristic of India, is largely represented by a case filled with artistic objects in the ornate designs favored by the Eastern workmen. Several of the large vases, bowls, trays and other articles are elaborately decorated in hammered patterns, inset with contrasting metals or jewels, and beautifully burnished.

A pair of wrought iron gates are of German origin and date to the eighteenth century.

The art metal gallery also houses a unique collection gathered by Dr. C. C. Marckres of San Jose and valued at $4000, less for its intrinsic worth than for its extraordinary historical interest. This is the collection of prison relics, shackles, handcuffs, leg-irons, chains and other grim objects, every one with its own history.

Here are Russian handcuffs with pads of leather to keep the metal from freezing fast to the flesh of the prisoners in the bitter cold of

Siberia; chains with which Russian political prisoners have been bound to the walls of their cells; Spanish prison ship shackles, 200 years old, which were riveted about the ankle of the captive, with the other end of the chain forged to the deck—shackles that could only be loosened by breaking the chain, as there is no lock.

Another set of Spanish torture irons were the type used on desperate prisoners. They were riveted to the ankles, one hand was cuffed, and the short outer chain was fastened to the wall. The weight of the chain served to drag the body of the unfortunate prisoner to the floor.

A curious set of Japanese handcuffs, or rather handcuff, was used to hold both hands of the prisoner, placed palm to palm and encircled by a single band.

The only pair of handcuffs known which were made especially for use on women is included in the collection, a pair of small cuffs made for slim wrists.

Thumbscrews, so often figuring in stories of years gone by, are here shown in actuality. They are ugly little affairs which were so designed that efforts of the prisoner to loosen his hands only tightened the screws, cutting the thumbs to the bone. Their use has been generally prohibited.

California history is recalled in the presence of the first pair of shackles used at Hangtown, now more mildly known as Placerville.

A heavy handwrought ball and chain were found in the hills near Hilo, Hawaii, a few miles from a prison. The story goes that when they were found, a fragment of human leg bone was in the shackle—a hint at some tragedy of escape and death.

Palmer shackles of the type used on slave ships, Andersonville relics, locks and keys from jails and prisons, and many similar trophies make this a most unique collection and one that is in little danger of duplication.

Pipes, Shoes and Mexican

Ernest Forbes Collection of Aztec Relics—Russian Dolls Illustrate Costume—Knives and Forks—Pipes of All Varieties—Shoes From Many Lands.

In one of the galleries of the old unit are placed a number of miscellaneous collections of varied interest, Aztec and Maya relics, Russian costume dolls, pipes, knives and forks, shoes, early typewriters and sewing machines and other articles.

The Aztec and Maya material is principally that collected by Dr. Ernest Forbes. Dr. Forbes lived in Mexico for many years and owned extensive holdings there until driven out by the revolutions. During his residence in the country he explored the jungle-hidden ruins and excavated in ancient burial and temple mounds, particularly in the district of Frontera, State of Tabasco, and unearthed a very valuable array of material, much of which is now on view in the museum.

He carried on his excavating largely in the burial mounds which thickly dot this district. They are found at a distance of a mile or so apart for a stretch of eighty miles, and are topped by sacrificial temples. Although there are no stones in the district larger than pebbles, the interior of the mounds is honeycombed with stairways, passages and cells for the victims of the approaching sacrifices.

At a depth of about forty-seven feet underground, Dr. Forbes unearthed the clay idols which are now in the museum. These rude bits of workmanship, roughly modeled of clay or chipped out of stone, represent the Aztec divinities, the warrior god, the god of cripples, the god worshiped by wizards at their professional gatherings, and others. The open mouths, staring eyes and angular features and the crude anatomy of the figures are all characteristic of ancient Mexican work.

The progenitors of the present Mexican Indians migrated into Mexico from the north, possibly from the Arizona and New Mexico cliff dwelling region, although rock paintings of unmistakable character have been discovered quite extensively in California, suggesting a migration by this route. At any rate, the Toltecs arrived in Mexico in the early Christian era and by the eighth century were well established at a point about fifty miles north of Mexico City, where they built cities. The name Toltec was not the designation by which they were known during their tribal lifetime, but means "builder" and was applied by later tribes to the unknown builders of the ruined cities they found.

About 1050 the Toltecs were driven south into Honduras, Guatemala and Yucatan, and there built the enormous edifices that are now crumbled ruins, hidden by creeping jungle. After them came the Chichimecas, and in the late twelfth century, the Aztecs started their pilgrimage from the northern districts. Seven tribal families joined in the migration, of which tribes the Aztecs were the chief. They settled at Lake Texcoco in 1325, directed there, according to tradition, by the sign given by an eagle perched on a prickly pear and strangling a serpent, the device that later formed the arms of Mexico.

At Lake Texcoco the Aztecs built the city of Tenochtitlan, and in 1376, the first authentic date in Mexican history, Huitzilihuitl was chosen king. The Aztecs quickly gained the supremacy over other tribes and maintained their strength until Montezuma I (1440-1469) sought to combine the powers of king and priest and allowed the priest clan to gain the dominance. These priestly rulers, who practically controlled the country, were probably responsible for the introduction and maintenance of the custom of sacrifice and grewsome rites of worship, described by early historians. In 1502 Montezuma II was elected king. Cortez entered Mexico in November, 1519, and by 1521 had completed his conquest.

In the Forbes collection are a large number of the curious clay and stone idols of the tribes, frequently only the heads, but sometimes the entire figure. No effort was made to give these representations of divinity, individuality or beauty. Except for the projecting armor that encircles his neck, the god of war might be the wizards' god.

A relic of ancient witch beliefs is a fragment of human frontal bone, rudely scratched with figures and used by the witches of Guerrero in their weird ceremonies. It looks not unlike Alaskan work.

As a check on immoderate drinkers or a reminder to an Aztec pulque seller was a drinking bowl, with stones in its hollow feet, so that the bowl rattles loudly whenever it is picked up. There could be no stolen drinks with such a utensil.

Carved stone money, stone spinning whorls, charms of green stone, probably jadeite; ceremonial dance masks of singular hideousness, pulque jars, oil and water vessels, incense burners, bead charms, necklaces, Guatemalan amulets used centuries ago by Maya priests—the Mayas were one of the earliest peoples, living in modern Guatemala, Yucatan and other Central American districts—fragments of carved stone and other objects make up the collection.

A display of Mexican pottery of more modern type occupies two cases, showing the natural-colored clayware and the popular and effective vermilion with its bold designs in black. The background for this and other exhibits in the Mexican division is made up of magnificent serapes and blankets given by Mr. de Young.

Miscellaneous articles in the Mexican division include a clay Aztec calendar, these people having worked out a most intricate and comprehensive method of dividing time; Talavera ware, the Mexican adaptation of the Spanish faience; bead work; the characteristic Mexican feather work; brass articles, candlesticks and bowls; basketry; native raincoats of heavy grass-like tules; jewelry, weapons, household utensils, and a large collection of native work.

In another case is a collection of Russian costume dolls presented by Mr. de Young. These dolls, about sixty in number, are dressed in made costumes or modeled in clay, costume and all. They are designed to show every style of Russian peasant costume as well as the national costumes of the better classes.

A case is devoted to shoes, boots and slippers. Here are Japanese sandals, Chinese shoes, including the tiny footgear of the women with bound feet; Persian sandals of wood inlaid with mother-of-pearl; slippers from Smyrna; boys and girls' shoes from Calcutta, adorned with beads; Turkish shoes from Constantinople; a pair of slippers, once the property of a chief in Kandy, Ceylon, that are amazingly decorated, beaded and embroidered, with their long toes turned back in a half-circle; Russian and Damascus boots of embroidered leather; Italian sandals; curious bast shoes from Russia, clumsy bark sandals

worn by peasants and tied on with cords, a style of shoe which gave way to more comfortable boots only in comparatively recent decades and is still worn in some districts; and a large number of miniature shoes, Dutch clogs, moccasins, Italian shoes, Egyptian slippers.

Pipes of all varieties are shown in another case. There is a Chinese opium set, complete from pipe to pill, as well as Turkish water pipes, hookahs, nargilehs, hubble-bubbles and other Oriental pipes with odd names; long-stemmed German and Dutch pipes with porcelain or carved bowls; meerschaums, carved ivory pipes and even the humble corncob.

A most elaborate example of saddlery occupies a case by itself. It is the heavily silver-mounted outfit used by Dixie Thompson, a well-known horseman of the early days, for parade purposes. The saddle, bridle and accessories are covered almost solidly with silver. The outfit was made in 1889, when Thompson lived at Santa Barbara.

A case is filled with trophies won in early bicycle races by the Bay City Wheelmen, and an example of their "iron steeds," an old-fashioned high-wheeled bicycle, is in another gallery.

Three unusual saddles are here; one a camel saddle, a highly uncomfortable looking affair, which must have its share in the traditional discomfort of camel riding; an Argentine saddle, used by the Argentine version of cowboys, and an old Spanish saddle with green velvet upholstery and embroidered leather flaps. It is in side-saddle form, and apparently served some lovely senorita of the early California days.

The grandfather of all typewriters is exhibited in the shape of the "Remington No. 1," a model made in 1873, which wrote capital letters only. Another old "caligraph" and several old-time sewing machines are shown.

Two cases hold Mr. de Young's valuable collection of antique knives and forks. These are examples of Flemish, French, Portuguese, Italian, Spanish and German work of the sixteenth, seventeenth and eighteenth centuries, going back to the time when every diner carried his own "tools" with him in a special case. The blades of the knives are sometimes elaborately chased, and the handles are of bone, ivory, porcelain, carved wood or metal, in most attractive period designs. With the rust of centuries carefully scoured from their blades, the old table utensils look now much as they must have done when their owners laid them down for the last time.

Knives were not placed on the table until the close of the fifteenth century, each person carrying his own with him. Knives, spoons and fingers served for all table purposes before forks were introduced. An early book of instruction for children warns its youthful readers "pick not thy teeth with thy knife."

According to the eleventh century Italian priest and scholar, Peter Damiani, forks were introduced into Italy by a Byzantine princess and their use spread rapidly throughout Italy. In France they are first mentioned in the inventory of the property of Charles V in 1379. As late as the sixteenth century, the use of forks to eat with was satirized as a novelty, although they were commonly used for serving. In French and Scottish convents, the use of forks was sometimes forbidden as sinful.

Thomas Coryate, who visited Italy in 1608, is credited with bringing the new fashion to England. As late as 1688, few noblemen owned more than a dozen forks.

The first forks had two prongs. Another prong was added, but four-pronged forks did not arrive until the end of the seventeenth century.

The Clock Collection

Ancestors of Modern Timepieces — First Regarded As Curiosities — Automatic Clocks Popular in Orient— American Clockmakers Led the World.

In the entrance gallery of the Royal Bavarian Pavilion, where for years the coin collection was placed, the museum's exhibit of clocks now finds shelter. About the walls stand tall grandfather clocks of various types, and glass cases hold a large number of French clocks of elaborate design and brilliant gilt.

The sundial, the clepsydra or water clock, the hour glass with its sand, and candle clocks painted with bands indicating the hours, were the ancestors of the modern clock. Revival of interest in sundials, especially for the adornment of gardens, has made them familiar objects. In front of the museum stands a good example of a sundial, a large bronze affair dedicated to the first navigators who reached the California coasts.

The clepsydra operated on the principle of the hour glass with water instead of sand to run through the hole. It was less accurate than the sand glass, however, as changes in temperature affected the rate at which the water flowed.

The first clock that resembled modern styles was made when some unknown inventor devised a scheme by which the water flowing through the clepsydra was made to fall on a revolving wheel and turn the hands on a dial. Just who invented clocks is an unsettled question, although claimants range all the way from the Chinese of 2000 B. C. to the Germans of the eleventh century.

Clocks first appeared in Europe about the thirteenth century, and were regarded as curiosities. They were all large affairs, designed to be placed in the towers of city buildings or on churches. Clocks for home use came later.

In 1288 a clock is recorded as having been erected at Westminster and in 1292 the Canterbury cathedral clock was put in place. Other cathedral cities followed suit, clocks were placed on town halls, and their use in public places spread rapidly.

The first small or portable clocks are attributed to a German clockmaker, De Souabe, who lived about 1300, but the first recorded mention of a "clock made so that he might carry it with him every place whither he might go," is dated 1480.

Chime clocks are first mentioned as the property of Margaret of Valois in 1577. German inventors, with their fondness for elaborate detail, began making automatic clocks with figures that moved and struck the hours in the late sixteenth and early seventeenth century. These were the predecessors of the intricate tower clocks found in many European cities with whole processions of moving figures. Automatic clocks of this type were frequently made at the order of Oriental princes and potentates, whose display-loving souls delighted in the complicated trickery of the clocks.

Under Louis IV boule work, the inlay of metal and wood invented

by Boule, was applied to clock cases as well as to other forms of work, and this paved the way for ornamentation of clocks, resulting in the elaborate gilt affairs characteristic of a later French period.

The earliest known specimen of an English grandfather or tall clock is dated 1681.

The museum collection of French mantel clocks, given by Mr. de Young, is representative of the early eighteenth century. It includes a large number of examples of the ornate gilt and enamel type favored by the clockmakers of Louis XV and Louis XVI, some with designs in inlay, others with panels of enamel and surmounted by gilt figure groups.

Clocks of similar description, given by other donors, complete the display of mantel clocks.

A curious example of East Indian work is a clock from Burma, made in elaborate Oriental design, like a pagoda, with elephants and other Far Eastern creatures figuring in the intricate carving of the case. The single hand is a metal lizard and the numerals are in Hindustani.

Another Oriental example is a Japanese clock, with intricate brass works and weights showing through its glass case.

A touch of romance surrounds one of the old English mantel clocks. It was found in Tsing Tau, China, and, while its case is of teakwood and the square face, in which the dial is set, is of brass carved with Chinese designs, the dial, hands and works are of English manufacture, apparently of the middle eighteenth century. The English clock must have drifted to China in the vagaries of trade, where a Chinese artificer removed its original case and substiuted the present case and brass face.

A typical American clock of the early nineteenth century, characteristic of the workmanlike clocks that gave American makers the leadership of the world, is marked on the dial, "Seth Thomas, Plymouth."

The grandfather clocks are English, French and Dutch in origin. Most of the French clocks are signed on the dial with the name of the maker, "Piettre et Yvetot," "Thiout, Paris," "Leon Chappelle a Luxueil les Bains," "L. Dauthiau, Her. (horologer, or clockmakers) au Roy a Paris." The first of these four examples is a Louis VI clock in a tall carved case; the second belongs to the Louis XIV period and has an ebonized case with ormolu mountings; the third probably about the same time, and the fourth is a Louis XV example, with a case of walnut and marquetry, especially beautiful in design and decoration. One of the French clocks shows the method of decoration invented by Boule and bearing his name. Its case of dark wood is inlaid with metal.

A seventeenth century clock from Normandy is unusual for its slender height. Its case is of carved wood in elaborate design.

Quaint old grandfather clocks from Amsterdam, dating back to the seventeenth and eighteenth centuries, show a popular form of clock decoration—the dials on which the days and phases of the moon were indicated. These dials, or, rather, semi-circular faces, were placed above the regular hour dial, and a little moon, often with features, moved across them to indicate the phases.

A typical English hall clock of the seventeenth century came from the workshop of Hugh Pannell, clock and watch maker of North Allerton, whose name is lettered on the dial. Over the dial, in painstaking lettering, is the inscription, "Take time by ye forelock." The case of this clock is of black oak, carved with designs and figures.

Royal Bavarian Pavilion

A German Living-Room Copied in All Its Details--Copies of Rooms in Foreign Palaces—Copy of the Blue and Gold Room of a Munich Palace.

Four rooms of the Memorial Museum are unique in that the galleries themselves, as well as their contents, are exhibits. These are the four rooms that are housed in the semi-detached building between the original Egyptian unit and the first new unit, and include the three rooms of the Royal Bavarian Pavilion and the old German room. One of the rooms of the Bavarian Pavilion is the Napoleon gallery and the other two, for years devoted to jewels and coins, now house collections of clocks and other objects.

The three small rooms that make up the Royal Bavarian Pavilion are a reproduction of some of the most famous rooms in the royal palace of King Ludwig of Bavaria at Munich, and were erected by the German Government at the Chicago Columbian Exposition. Later they were sent to the Midwinter Exposition at San Francisco and there purchased entire by Mr. de Young as one of the selections made from the Midwinter Exposition exhibits, moved to a position adjacent to the museum building and enclosed in the present housing. The German Government is said to have spent $81,000 in building the rooms and sending them to Chicago and San Francisco.

Ludwig of Bavaria (1786-1868) was a monarch of very picturesque career. Caring less for affairs of state than for patronage of the arts and enjoyment of momentary pleasures, he encouraged scholars, was a friend and patron of Goethe, wrote poems, ordered the erection of many beautiful public buildings and generally lent his aid to fine arts. His private life was of a less commendable character, and his infatuation for Lola Montez, the dancer, was a contributing feature to the public unrest that brought about the revolution of 1848, as a result of which Ludwig resigned the throne to his son, Maximilian.

Maximilian, according to history, was a very different type of ruler. Ludwig had collected a gallery of portraits of beautiful women, among whom the Montez was prominent. Maximilian promptly removed her picture, but, if the picturesque story is to be credited, the tapestry walls of the gallery showed such a contrast between the somewhat faded background and the unfaded square where Lola's portrait had hung that Maximilian had to order the entire room done over.

Work on the Munich palace was completed by Ludwig II, son of Maximilian, who succeeded his father in 1864. This second Ludwig was an eccentric bachelor, devoted to the arts and excelling even his grandfather in the lavish nature of his encouragement to painters, architects and other artists. Regardless of expense, he ordered the construction of many buildings, palaces, art galleries and other structures, running the country deeply into debt to pay for his freaks. At last his unbridled extravagance caused his ministers to take steps to restrain him, and on June 10, 1886, he was formally declared in-

sane. Three days later he escaped from his guards and drowned himself in the waters of the river.

Reached by a short flight of steps from the adjacent gallery, the first room of the three, originally devoted to the coin collection, is copied from a dining-room in the palace. The heavy beams and window casements of dark wood are painted in elaborate floral designs, the work of Otto Hupp of Schleissheim. Gabriel Seidl, a renowned German architect, supervised the work of designing the group of rooms, assisted by the leading artists and builders of the nation.

The second room, the largest of the three, where the jewel collection was on display for years, is copied from another palace room, with every detail of the elaborate decoration faithfully carried out. The frescoes, inlaid designs, marquetry, marble work and wood carvings of the original rooms are reproduced in minute detail and color, even to the coloring of the marble.

The vaulted ceiling is adorned with frescoes representing scenes from the Nibelungenlied, painted by Von Lenbach, Rudolph Seitz and H. Kellner, leading German artists. The beautiful marquetry doors are by Joseph Rathgeber of Munich.

Covering the walls are damask brocade tapestries in deep crimson, reproducing the design of the original wall coverings and woven by court weavers especially for this use.

Door and window casings, and the elaborate marble fireplace, are exact copies of the originals.

Opening off this room is one of the most interesting and important rooms of the museum, the small semicircular gallery where are displayed the Napoleonic relics. They are placed in a room that is copied from the Blue and Gold Room of the Munich Palace, its walls hung with tan-colored velvet and its woodwork beautifully decorated.

A room that invariably attracts much attention also opens from the central hall of the Bavarian pavilion. It is the old German living-room, reproducing in its massive style the type of room found in many an old-time house of Germany or Holland. The work was done by pupils of the Royal Technical School of Berlin.

The entire room is of carved oak and is built without nails, the sections carefully fitted and mortised together. There is a large bay window fronting the door, its panes of heavy glass in a design of small circles—an effect that has made many a visitor believe that he was gazing into the family wine cellar, so exactly does the design resemble the bottoms of bottles, laid row on row. The room contains a large fireplace and mantel, a characteristic built-in bed, cabinet, door bench and several pieces of furniture, all in accurate detail and elaborately hand carved.

Over the door, window and bed are carved inscriptions in old Dutch, reading as follows: Over the window, "Lever Dod as Slav" (Rather Dead Than a Slave); over the door, "In Nord und Sud de Welt is Wit, in Ost und West to Hus is Best" (In North and South the World is Wide, in East and West, Home is Best); over the bed, "Slap in Sta Op" (Sleep in or Stay Away).

Some good examples of old Delft ware are placed on the fireplace mantel and on the plate rails.

The Napoleonic Collection

A Remarkable Assemblage of Relics of the First French Emperor—Objects Personally Used by Him and Connected With His Activities—Relics of Great Frenchmen.

It is a triumph of collection that the Memorial Museum, thousands of miles distant from the scenes of Napoleon's activities and beginning its work many years after other museums, more fortuitously placed, had thoroughly explored the fascinating field of Napoleonic history, has been able to gather together such a remarkable collection of personal and important relics of the Corsican as may be found in the Napoleon room. Intimate souvenirs are accompanied by certificates of authenticity, and every article in the room has been thoroughly and exhaustively investigated and its history traced, so that no doubt rests on the historical value of the collection.

The Napoleon relics now occupy two galleries of the old building, the inner rooms of the Royal Bavarian Pavilion. The smallest room of the three, a semicircular alcove of considerable size, is given over to the exhibition of the famous gilt bed, the gilt throne chair, two magnificent Sevres vases painted by Despre after Meissonier with scenes depicting the battle of Austerlitz and the return from Moscow, a good bronze of Napoleon and a number of engravings and other pictures of Napoleon and his associates.

In the gallery adjoining, with its crimson brocade walls, are displayed the more personal relics. Here, in wall cases, are the smaller articles associated with the Emperor, documents and miniatures.

This gallery also contains as floor exhibits several interesting examples of unique transportation. In the center of the gallery is a large sleigh of French make, dating to the period of Louis XIV. There is also a picturesque sedan chair of the Louis XVI period, decorated with panels "en vernis Martin," or adorned with the famous varnish that bears the name of its inventor. The chair is upholstered inside with pink brocade and probably served to carry some fair lady of the time to court balls. A Dutch sledge and a Russian sledge, small and not particularly comfortable in appearance, complete this display.

Several small marbles and vases are also exhibited in this gallery.

Occupying a place of honor in the room is one of the seven throne chairs used by Napoleon during his reign. It was a whim of the Emperor to have throne chairs conveniently distributed about his empire, that he might always find proper accommodation on his journeys. Seven of these chairs are known to have been installed in various palaces; the example in the Memorial Museum has been traced to the Palace of St. Cloud.

During the advance of the Prussians in 1870 and the destruction of French property, the throne chair in question was secretly removed from the palace by a loyal Frenchman, who sought to keep the treasure from falling into the hands of the invaders. So successfully did he hide it in a cellar filled with rubbish that it was entirely forgotten

One of the finest collections of artistic carved ivories. Jewel Gallery.

until the death of its preserver, when his heirs rescued it from the rubbish heap and sold it. Its removal to the United States was accomplished by an adroit bit of diplomancy, for such a valuable relic could not easily be taken from the country; but removed it was, and it now forms one of the chief exhibits of the room. Bernard Franck, the famous expert on the Napoleonic period, has certified to the authenticity of the chair.

The chair itself is a typical First Empire piece, carved and gilded, and with rose tapestry back and seat, the back embroidered with the golden "N." The hand-rests at the ends of the arms are round balls of wood, and although the rest of the chair is brilliant with gilt, these balls are bare of adornment and smoothly polished. A picturesque bit of history attaches to this absence of gilding. Napoleon, as all biographers state, was of an extremely nervous and restless disposition and one way in which this was manifested was in his habit of incessantly handling objects. As his hands rested on these wooden balls, the story goes, his fingers were in constant motion, rubbing and moving over the originally gilded surface until the gilt was worn off and the wood polished to a satin finish.

Another unique relic contained in the collection is the elaborate carved and gilded bedstead, a reminiscence of one of Napoleon's many affaires du coeur. The heroine of the story was the beautiful Mlle. Mars of the Comedie Francaise and the bedstead, Napoleon's gift to her, is a copy of Napoleon's own bed in the royal palace of the Tuileries. A suggestion of the Emperor's small stature is found in the abbreviated length of the bed, for a man of even ordinary height would be puzzled to find comfort in it. The bed is a massive affair of carved wood, covered with heavy gilding, with figures supporting the four corners. Head and foot are tapestried with rose silk, worn by time and the ruthless attacks of souvenir hunters.

Over the bed hang two excellent engravings of Mlle. Mars, unearthed by Mr. de Young in Paris antique shops.

On the wall over the throne chair hangs a relic of another Napoleon—the Aubusson tapestry table cover which was among the wedding gifts of Napoleon III and Eugenie at their marriage on January 30, 1852. Another relic of this later Napoleon is found in the framed birth certificate of Mathilde Louise Eugenie Lacour, a godchild of Napoleon and Eugenie. Mathilde Louise Eugenie attained this distinction by being born on March 16, 1856, the day of the birth of the Prince Imperial. Napoleon and Eugenie signified their pride of parenthood by standing godparents to all children of France born on that day.

The Napoleon family group is portrayed in a collection of miniatures arranged in a wall case. There one sees Napoleon himself as a young man and in later years; Marie Louise, Josephine, the pathetic little King of Rome, and Napoleon's sisters, brothers and mother.

One case contains six miniatures signed "David, 1810." They portray Napoleon, Josephine, Murat, Ney, Mme. Tallien and Duchesse d'Abrantes.

The collection is rich in personal relics. There is an inkstand often used by Napoleon—it is fascinating to imagine what plans of world-empire were drafted, what history-making documents were written as the Emperor dipped his pen into this massively plain brass and glass inkstand. Another supreme moment in Napoleon's life is recalled by a bit of brass tubing, prosaic at first glance, but endowed with significance and romance in the realization that these few inches of brass formed the tube of the telescope used by Napoleon on his return journey from Elba, gazing toward the land whose empire he sought.

Pictures of Napoleon have made the world familiar with an invariable feature of his dress—the plastron or X-shaped waistcoat worn with his uniform coat. Here in one of the wall cases is this very plastron, a white felt affair showing signs of wear. With it is a wide piece of time-faded red ribbon, the ribbon of the Legion of Honor worn by the Emperor, and a pair of shoulder straps. Most intimately personal of all is a lock of brown hair. All these relics are given certification of authenticity in letters signed by Evrard, valet to Napoleon and as famous in his way as his master was in his greater fashion.

A wooden flute used by Napoleon pictures his lighter moments, as a map of Waterloo, a facsimile of a plan of the battle of St. Jean d'Arc, drawn by Napoleon himself, and several Waterloo relics recall his days of war. The romance of the Brussels night of June 18, 1815, when "lights gleamed on fair women and brave men," is brought to the imagination by a pair of ivory dice boxes, used in the play of that night by English officers, who, the next day, were to join in the momentous conflict of Waterloo. These boxes were given to Dr. W. H. Cluness by an English patient in the hospital after the battle, and have passed from hand to hand before reaching their final resting place on the museum shelves.

Completing the Napoleon cycle are relics of the last tragic days at St. Helena. Treasured under glass are half a dozen fragments of wall paper from the rooms of the house the deposed Emperor occupied during those grim years, and the final chapter is written in a handful of withered leaves gathered from the tomb of Napoleon.

Documentary relics are numerous, including several signatures, letters and hasty sketches.

In the Napoleon room are also relics of two other great Frenchmen—a letter signed by Cardinal Richelieu and several documents bearing the signature of Victor Hugo.

The student of Napoleon will not, however, confine his museum researches to this gallery. Several other galleries must be visited; the coin gallery, where is placed the splendid collection of Napoleonic medals and coins; the art gallery, where hangs Feodoroff's powerful painting of Napoleon's "Last Day at Moscow"; the engraving collection, for inspection of a remarkably complete exhibit of Napoleonic cartoons, largely English caricature; the armor hall, to see helmets, guns and swords of the period, including the sword once the property of Murat; the nautical exhibit, where one of the treasured relics is a battered piece of wood, the stem of the ship Natalie, on which Napoleon voyaged from Elba to France, and the cases of miniatures in one of the art galleries to study the portraits of Napoleon and the men and women of his time.

A Gallery of Replicas

Reproductions of Antique Greek Statuary, a Gift From the Government of Greece—the Great Works of the Sculptors of Ancient Greece Well Represented.

As the gift of the Greek Government from the collection exhibited by Greece at the Panama-Pacific Exposition in 1915, the museum added to its treasures an entire gallery full of reproductions of antique Greek statuary, including several very famous pieces, as well as characteristic fragments of various periods.

The most prominent feature of the collection is a reproduction of the world-famous Laocoon. The group, the original of which was discovered on the side of Esquiline hill, in Rome, in 1506, and bought by Pope Julian II for the Vatican, is a representation of Laocoon, a priest of Apollo, and his two sons at the moment when serpents, sent by the angered god, came from the sea to destroy them. Laocoon incurred the wrath of Apollo by warning the Trojans against the ruse of the Wooden Horse. In revenge, Apollo sent two giant serpents to destroy the priest and his sons while they were officiating at an altar on the seashore. The incident is described by Virgil in the Eneid.

The group is said to be the work of three Rhodesian sculptors, Agesander, Polydorus and Athenodorus, and dates back to the last forty years before the beginning of the Christian era. It is therefore representative not of the best period of pure Greek sculpture, but of the years after the Roman conquest, when other influences were being exercised upon the Greeks, causing them to lose their loyalty to the ideals of beauty and perfection.

Greek sculpture has been divided by authorities into four principal periods—Archaic, extending to 480 B. C., or the period of the Persian wars; Attic, 480 to 323 B. C., when Athens was the center of Greek glory and the most wonderful buildings of that city were erected; Hellenistic, 323 to 146 B. C., ending with the Roman conquest; and the final period from the Roman conquest to 330 A. D., when Constantine transferred the capital of his empire from Rome to Byzantium or Constantinople, and the Byzantine period began, to continue until the fall of Constantinople in 1204.

The Archaic period was largely formative. With the Egyptians as their first teachers, the earliest Greek sculptors followed the formal, unnatural style of their instructors. The pose of the early Archaic statues is Egyptian; arms are stiffly held, or, more usually, placed closely at the sides; faces are expressionless and lines are angular. The first Greek temples and monuments do not date back farther than about 700 B. C., and sculpture in the round goes back to about 650 B. C.

After a period of careful adherence to Egyptian teachings, the natural Greek love of beauty began to assert itself, and an increasing freedom became manifest in the pose of the statues and the ex-

pression of the faces. Sculptors dared to lift the arms of their figures, turn the heads, move the legs in the attitude of walking.

The glory of the Attic period of sculpture was largely due to the influence of the Greek games. Here sculptors and public alike had an opportunity to study the human body in the poses of action. No finer school could have been devised than the Olympic games with their runners, discus throwers and splendid young athletes at the height of their powers. There came a growing demand for statues of athletes, and the sculptors hastened to supply it. Such statues as the Discobolus, the Runners and others, shown in the museum both in plaster reproduction and in bronze, illustrate the work of this period.

The fifth century B. C., known as the age of Phidias, was the period of Greek glory in art. During this century came the erection of such architectural marvels as the Acropolis, the Parthenon, the Erectheum, the Propylae and other great buildings. Sculpture was applied to the decoration of these structures and the tendency was toward idealization.

An interesting development of Greek statuary, especially at this time, was the carving of steles or tombstones. Many of these pieces are numbered among the museum reproductions. The carvings on the steles, in medium relief, commonly represented the dead man or woman engaged in the avocations of daily life, sitting among relatives and friends, reading, sometimes playing with pet animals, with no suggestion of death or the grave. Only occasionally is a stele found on which mourners are represented.

The fourth century was the time of Praxiteles, known for his splendid semi-portrait statues, especially of young men. The Hermes of Praxiteles, a reproduction of which is included in the museum collection, is one of the most famous pieces of all Greek sculpture. At this time more attention was paid to individual work; there was less of state enterprise, fewer great buildings were erected and sculptors turned from idealization to portraiture. More care was given to the modeling of faces, as the Hermes and other statues show.

The Theater of Dionysius at Athens was the great architectural enterprise of the century. A reproduction of a priest's chair from this theater is in the museum.

With the conquests of Alexander at the beginning of the Hellenistic period came the influence of the Orient. A tendency arose to commemorate great national events, campaigns and battles, with massive monuments. In the designing of these, backgrounds came in for more attention. Lysippos, a sculptor of this period, is credited with the original of a Hermes, a copy of which is reproduced for the museum, and comparison between this and the Hermes of a century earlier is interesting. Among the famous statues of this period are such figures as the Nike or Victory of Samothrace, the Dying Gaul and others.

With the beginning of the Roman period, Greek art lost its originality. Greece was thoroughly plundered to enrich her conquerors, and so many outside influences entered that Greek sculptors became merely copyists.

Historical Objects

Vallejo Carriage — Doors From Newgate Prison — Old Documents—Autographs—Old Newspapers.

Installed in the gallery of the old unit that for years housed the nautical collection is a display of miscellaneous objects of general historical interest. The greater part of the exhibit is made up of old documents, yellowed old newspapers, legal papers of Revolutionary days, time-worn letters and similar material. Historical material dealing with California and San Francisco is also found in the Pioneer gallery.

Two unique items in the exhibit are the Newgate door and the Vallejo carriage. The carriage, an old-fashioned barouche, was brought from England to Sonoma in 1830 and served General Vallejo, that picturesque figure of early California days, when he wished to ride in state.

The Newgate door is touched with the romance that centers about the daring figures of the highwaymen of Georgian days when the belated traveler was likely to find his post-chaise halted on a lonely road and himself relieved of his valuables. It is the end of the story that is recalled by the battered old door, for behind this door, when it swung on its hinges at cell No. 25 of the Newgate prison death row lay in their turn. Dick Turpin, Jack Sheppard and Paul Clifford, probably the most notorious of the gentlemen of the road. The records of the prison show that these three prisoners occupied No. 25 in the row of thirty four cells, and here, miles away from its London jail, is the door of that very cell.

In addition to Turpin, Sheppard and Clifford, all of whom ended their careers on Tyburn Hill, the records show that this particular cell at one time housed American seamen, captured during the Revolution.

The door was taken from the prison in 1902 when the building was razed. Newgate was then fallen to ruin inside its walls. The cells of death row, underground and dismal, were a heap of debris from which the door was rescued.

Autograph letters and documents form an interesting and valuable part of the collection. There are several letters written by George Washington to his officers of the Revolutionary army, approving their actions and making suggestions. Other autographs are of Frederick the Great of Prussia (1740), William Penn, Wellington and other notables of the world's history.

The old documents cover a wide field. Many letters of a century or so ago are shown. There are deeds and land grants, some roughly written, some engrossed in the intricate style that ruled before the days of typewriters and printing. So delicately minute is the lettering of some of these old documents that they can be read only by deciphering one word after another.

Colonial land grants, deeds to property now in the hearts of great cities and then untilled farm land, contracts and many other documents are collected in the well-arranged cases.

An interesting item is the pay roll of Colonel James Robichaux's battalion "in the service of America," of which Colonel James Livingston was apparently in temporary command, according to the document. The pay roll, covering the months of April and May, 1775, shows that the "wages for one month in lawfull money" were twelve pounds for a captain, eight pounds for a lieutenant and two pounds for a private. The new Nation had not yet reached the point of using its own coinage, and English money was current. The captain of that day, with his twelve pounds a month and the private with his two pounds could scarcely be said to be serving their country for financial gain.

The collection of old newspapers is especially large and interesting. Among the items is a Saturday Evening Post for April 24, 1830, "devoted to literature, morality, science, news, agriculture and amusement," a fairly extensive field and one that affords interesting comparison with its modern descendant.

Many of the old newspapers are valuable for their accounts of momentous historical events, decisive battles, important elections, scientific achievements, industrial enterprise and great events of world news. Early California newspapers are also represented here as well as in the Pioneer gallery, the collection giving a valuable summary of the State's history from the time of the first little publication.

A case of old-time almanacs of the Poor Richard variety is unique and complete.

Portraiture of a century ago is illustrated in a case of daguerreotypes, silhouettes, tintypes, ambrotypes and similar predecessors of the modern photograph. The quaint faded pictures with the old-fashioned costumes and stiffly correct poses of their subjects are delightful.

A programme found in the Lincoln box at Ford's theater on the night of Lincoln's assassination is an example of the miscellaneous collection of historical treasures.

The Colonial Exhibit

Old-Time Kitchen and Bedroom Reproduced—Loom and Spinning Wheels—Revolutionary Relics—China and Earthenware.

In the new arrangement of the museum, two galleries are devoted to the display of the large collection of Colonial-period objects, a very representative and interesting exhibit of the industry, art and daily life of a century and a half ago.

The Colonial kitchen and bedroom are quaint corners that invariably attract attention. In the corner gallery a huge stone fireplace has been constructed, with the heavy plain mantel of Colonial days. Antique andirons, kettles, griddle irons, tongs, bellows and similar articles of fireside use are placed here in most appropriate surroundings. On the shelf above are ranged dozens of objects of daily use—candlesticks, snuffers, hour glasses, warming pans, jugs and bowls, old kitchenware—and all the collection of quaintly fashioned utensils that served the housekeeper of Revolutionary days.

Hung from the heavy beams of the kitchen are bunches of herbs, ears of corn, battered old lanterns and just such an array of miscellaneous objects as dangled from the beams of the old-time rooms. The clumsy kitchen utensils, farm tools, warming pans and larger articles hung against the wall, bring vividly to mind some of the difficulties of Colonial housekeeping and farm tending.

Next door to the kitchen is a fascinating corner that inevitably calls forth interested comment. Here, beside a window draped with neat white curtains, is placed an old-time four-poster bed of rich dark wood, with the turned pilasters and canopy of a century ago. It is covered with an old hand-woven spread and the pillows are embroidered. Close beside it stands a roughly made little cradle, with pillows and quilt, in which some Colonial baby doubtless was rocked to sleep. Old-fashioned rag rugs are on the floor.

Among the larger objects of the Colonial collection is a loom used in New Haven in 1749, a clumsy affair of heavy, rude beams and treadles. Hanging in a wall case is one of the patterns used by the New Haven weaver, a curious and cryptic scrawl of letters and numerals.

The collection of spinning wheels is large and interesting. There are American, German and French specimens, dating back to the seventeenth and eighteenth century, and representing all types of wheels from the little flax wheel to the tall affair for spinning wool. Reels, bobbins, apparatus for combing the wool and other necessities of the spinner are also shown.

What difficulties the farmer of 1775 had to overcome are illustrated in the display of farm tools. The ox yoke evokes a picture of the farm motive power of the period. Wooden plows, presses, home-made axes, heavy spades and hoes, and other tools show that modern improvements were still far distant.

Revolutionary relics are contained in one case, including flintlock muskets, powder horns, bullet pouches, knapsacks and other military material.

Bits of Colonial furniture are arranged about the gallery, to complete the furnishings of the kitchen and as individual exhibits. A worn old table, evidently of home manufacture, rush-bottomed chairs, low fireside stools and wall cupboards are among the specimens. An interesting exhibit is a rudely made cradle used in Chicago when that city was a settlement of only five houses.

In the wall cases of the two galleries are large numbers of objects of brass, pewter, silver, china and earthenware, as well as an excellent collection of needlework.

The pewter display is especially good, including bowls, pitchers, jugs and dishes of all shapes and sizes. Pewter was a luxury in the days of the Pilgrims. Wooden trenchers served these hardy pioneers, and, even up to later days, wooden dishes appeared on many tables. Before the Revolution pewter was very popular and took the place of silver dishes, except for the wealthy. The London Guild of Pewterers was one of the important trade organizations of the time.

About the beginning of the seventeenth century American pewter makers began to develop the industry, taught by English pewterers who came to this country in earlier years. Richard Graves and Henry Shrimpton are notable names among these English migrants who brought the knowledge of their handicraft across the sea.

Until the Revolution opened the way for the development of American trade with foreign countries, china, except for native products, was little used. After American ships began to visit the ports of the Far East, however, Oriental porcelain became the fad and pewter lost its importance. It was still largely used, however, and is frequently mentioned in advertisements and records of the early eighteenth century.

Old wills contain many paragraphs referring to treasured pewter. The will of Governor Bradford of Massachusetts leaves to his heirs "fourteen pewter dishes, thirteen platters, three large plates and three small ones, one pewter candlestick and one pewter bottle." Miles Standish is credited with bequeathing to his heirs "sixteen pewter plates and twelve wooden trenchers."

An interesting collection is of articles used in the family of President Polk. The exhibit includes many pieces of china and silver, articles of wearing apparel, embroidery, shawls, documents and other objects.

The cases devoted to china and earthenware are well filled with a representative display of the work of the period. Especially good is the collection of Colonial pottery, including examples of the Staffordshire school, majolica, ironstone, Wedgwood and other wares, with many of the pictorial plates and dishes that are so valued by collectors.

A picturesque and quaint array of tobys may be found in one case. These jugs of pottery, with their shapes wrought into the plump forms of jovial old tipplers, mirthful faces, cocked hats, costumes and all complete, are delightfully humorous and individual.

Old silver spoons form an interesting collection in one wall case, and other examples of Colonial silverware are assembled in the general exhibit. There is a good display of the highly valued lustre ware.

Samplers, lace, embroidery, hand-woven spreads, patchwork quilts, knitted stockings, silken mitts, bead bags and many other examples of the beautiful handiwork of Colonial women are gathered in a fascinating array.

The patient fingers of little girls of long ago wrought the samplers, with their dutifully pious inscriptions, their alphabets, their borders of astonishing flowers and more astonishing men and women. The names of the youthful makers and the date were almost invariably added to the decoration, so that samplers have the advantage over almost every form of antique in that they can be accurately dated and credited.

The embroidery includes several tiny bonnets for long-ago babies, wedding shawls, handkerchiefs, ruffles and flounces, bits of adornment for gowns, and even the formal "tidy" that was the delight of the careful housewife.

Patchwork quilts in the intricate patterns understandable only by expert needlewomen, hand-woven spreads in thick, fluffy white, and some of the beautiful old blue and white spreads that are so valued by their fortunate owners, as well as dozens of miscellaneous examples of old-time needlework are gathered in the cases. Bead bags and purses, knitted garments, quaint old bits of adornment and many other articles are there to make the display complete.

Natural History Galleries

Collections of Birds—the Great Variety Found in America —Butterflies—Insects—Humming Birds—Snakes, Etc.

It is quite probable that hundreds of the visitors who explore the galleries of the Memorial Museum fail to discover one of the most interesting of all the exhibits, the excellent collection of natural history material which is at present housed in the mezzanine gallery of the old unit, filling every available inch of space several times over. A glimpse, through the rotunda of the Greek statuary hall, of mounted heads and other specimens leads the curious to find their way up the stairs—to be more than repaid for their investigations by the collection on display.

Beginning under the guidance of Professor Ferdinand Gruber, the natural history department has had a somewhat varied career, sometimes under the administration of experts and occasionally suffering from neglect so that valuable specimens have been rescued from total loss only by the vigilance of the later workers. But, in spite of past neglect, the exhibits are there; it remains only to complete their arrangement so that they show to advantage.

Henry Trost, recent head of the department, began the work of renovation and it has been continued by Robert Belmont.

Of four divisions of the natural history material the museum is especially proud. These are the representative and complete collection of birds, containing hundreds, probably thousands of specimens; the collection of eggs, ranging from the humming bird to the eagle and the ostrich; the cases of shells and sea life and the Hornung collection of skulls and articulated skeletons of birds and small mammals.

The cases that contain the birds fill the greater part of the wall space, with every available inch of shelf room crowded with specimens from all countries. They are classified, so far as it has been possible in the limited space, according to country and type; birds of North America filling several cases and the general display covering the smaller birds, gallinaceous types, water fowl, sea birds, birds of prey, the eagle families, and so on.

The collection of North American birds is particularly complete. Probably every known variety of bird found on the continent is represented, in most cases by several specimens. Arranged according to geographical localities, the student of American bird life may spend many hours in a comparative study of the specimens.

Hundreds of specimens of tropical birds are shown, the majority mounted and others represented by skins, awaiting the work of the taxidermist. Rare birds of the jungles are there, birds from the distant islands of the sea, the gorgeous flamingo, the egret with its treasured plumes, a very complete collection of birds from the Philippine islands, the sacred white peacock from India, quite at home in a case with several of his more ostentatious brothers, and many other unusual types of bird life.

Among the rarities are several fine examples of the bird of paradise, some extremely rare and some extinct. These valuable specimens are arranged in a special case where the beauty of their plumage is shown to full advantage.

Another modest-looking little bird that perhaps fails to attract the attention he deserves is the passenger pigeon, the bird whose enormous flocks in flight once darkened the skies, offering such easy prey to unrestrained hunters that the species is now extinct. One lone living specimen was treasured in an Eastern aviary for some time and it was hoped to continue the race, but the pigeon died before the hoped-for family had been established and passenger pigeons now exist only in museums.

Those who have visited these galleries at night declare that tiny spots of light glow from two cases that stand near the entrance stairway. The cases are devoted to the humming bird collection and the mysterious glimmer comes from the radiant feathers at the throats of the tiny birds, feathers that even in the broad light of day seem to glow with living fire.

The humming birds, scores of them of every variety, are mounted on branches in a natural setting, tiny luminous jewels among the green twigs. The ordinary humming bird, brilliant though he may be, appears modest and dingy beside some of these amazing little creatures with throats of flame.

It would be difficult for any one to name a bird, obtainable by collectors, which is not represented in the museum display. From humming birds to ostriches, from desert road-runners to the huge albatross of the seas, from the unassuming barnyard hen to the eagle of the upper air, from ptarmigans of the Northern woods, wearing their winter coat of snow-white feathers, to the clumsy-billed toucan and gorgeous macaws of the tropical jungles, the birds have been brought together from the four corners of the world to their places on the museum shelves.

Supplementing the display of birds is the collection of eggs, an unusually complete assortment from the tiny egg of the humming-bird to the ponderous egg of the ostrich. Casts of the eggs of the extinct kiwi bird, great auk and other lost species, reproducing exactly in size and coloring the original eggs, add to the interest.

A case of nests of unusual structure, the delicate work of the weaver-bird, the bottle-necked affair built by a tropical expert, all types of nests with their proprietors perched near by, is also on display.

The shell collections are another source of pride in this department. Case upon case holds rare specimens from all parts of the world, tiny shells of pearly texture and delicate structure, spiny sea urchins, huge rock shells, practically every known variety. The coloring of some of these shells is worthy of study in itself, particularly the case of tiny pointed shells near the door, colored like the most exquisite mosaics.

The shell collection is supplemented by several cases of fossils and petrifications, including some unusually good specimens of fossilized fish, their delicate bony structure imprinted on the ancient rocks in perfect detail. Mastodon teeth, pieces of bone and other exhibits are in these cases.

The display of mounted insects is also of interest to the natural history student. Butterflies by the hundred, beetles of all varieties, from those scarcely larger than a pinhead to enormous and terrifying creatures with great jaws; moths, tropical insects, all are here in profusion. One of the rare collections is that of South American specimens collected by Elyseu Azevedo of Rio Janeiro and presented by Mr. de Young.

The life of the sea is represented by a large collection of fish, corals, crustaceans and other specimens. Particularly noteworthy are the cases of corals, many rare and beautiful specimens effectively arranged on a bed of their native sand. One case holds fish of extraor-

dinary varieties, the quaint little sea horse, the bottle fish, flying fish and other freaks of the sea. Crabs, lobsters and their relatives are there in numbers, including some enormous tree-climbing crabs from the tropics that would be most undesirable creatures to encounter unprepared.

The Hornung collection of skulls and skeletons has perhaps no rival of its type. It was made by Dr. J. C. Hornung, an eminent English naturalist, with whom the collection and preparation of these tiny specimens was a lifelong hobby. The collection came into the possession of the museum through the fortuitous chance that brought Dr. Hornung to San Francisco after a tour of exploration in the Orient, in need of funds to make possible his return to England, and willing to sell his treasures in his need. Mr. de Young promptly bought the collection for the amount of which Dr. Hornung stood in need, and thus the museum came to own a remarkable scientific display.

The three cases which hold the exhibit are filled with hundreds of tiny skulls and skeletons, perfectly cleaned and prepared. They are all relics of small birds and the smallest mammals, nothing larger than a squirrel or a duck. Preparing these tiny specimens was a matter of careful boiling to soften the flesh, and then the most painstaking work of stripping and picking the flesh from the bones, such minute bones that the accidental slip of a scalpel meant their destruction. All of the specimens are absolutely perfect, without crack or flaw.

The most remarkable specimen of the lot, perhaps, is the articulated skeleton of a humming bird, complete to the last threadlike bone. Skeletons of common mice, tinier field mice, rats and other small animals are also in perfect condition, every bone in place.

A small case is filled with specimens of snakes, including a good collection of rattlesnake skins and rattles. There also is a mummified snake of the kind that finds its eventual destiny in the mortar of some Chinese maker of strange medicines.

The museum collection of mammals consists principally of specimens of the smaller varieties with the larger animals represented by heads and masks. Two good specimens of gorillas will some day be the nucleus of a picturesque group, and monkeys of various types that once delighted the youngsters who visited the zoo at Golden Gate Park alerady have been set to climbing trees and swinging from branches, as they did in life.

The natural history department has been the ultimate destination of the majority of animals and birds that once inhabited the park cages. Peacocks that once paraded languidly over the park lawns are now on display, one particular specimen splendidly mounted to show the richly colored tail feathers. A buffalo from the park paddock, where the buffalo herd is a constant attraction to hundreds of visitors, now stands in a glass case, pursued by wolves and coyotes.

Monarch, known for years as the dean of the bear pit, also is there. Monarch, a California grizzly, spent nearly all his life in captivity, as he was taken in early youth in the San Bernardino mountains. That was in 1885, and until May, 1911, he reigned over the cages, dying at last of old age and weakness.

The Herman Schussler collection from South Africa is of unusual interest. It includes principally mounted horns of antelope, hartebeest, wildebeeste and other creatures of the veldt, whose names, at least, are familiar to the followers of Rider Haggard and other novelists. The collection also has specimens of rhinoceros tusk, lion skulls and other exhibits.

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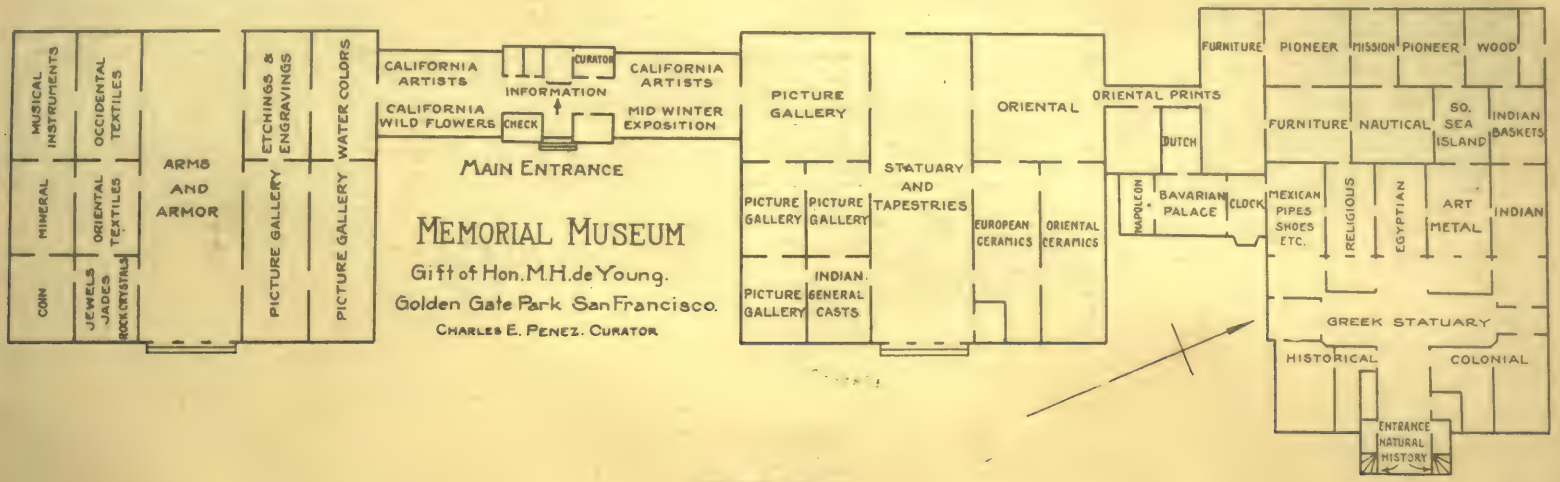
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MAIN ENTRANCE
MEMORIAL MUSEUM
Gift of Hon. M.H. de Young.
Golden Gate Park San Francisco.
CHARLES E. PENEZ. CURATOR
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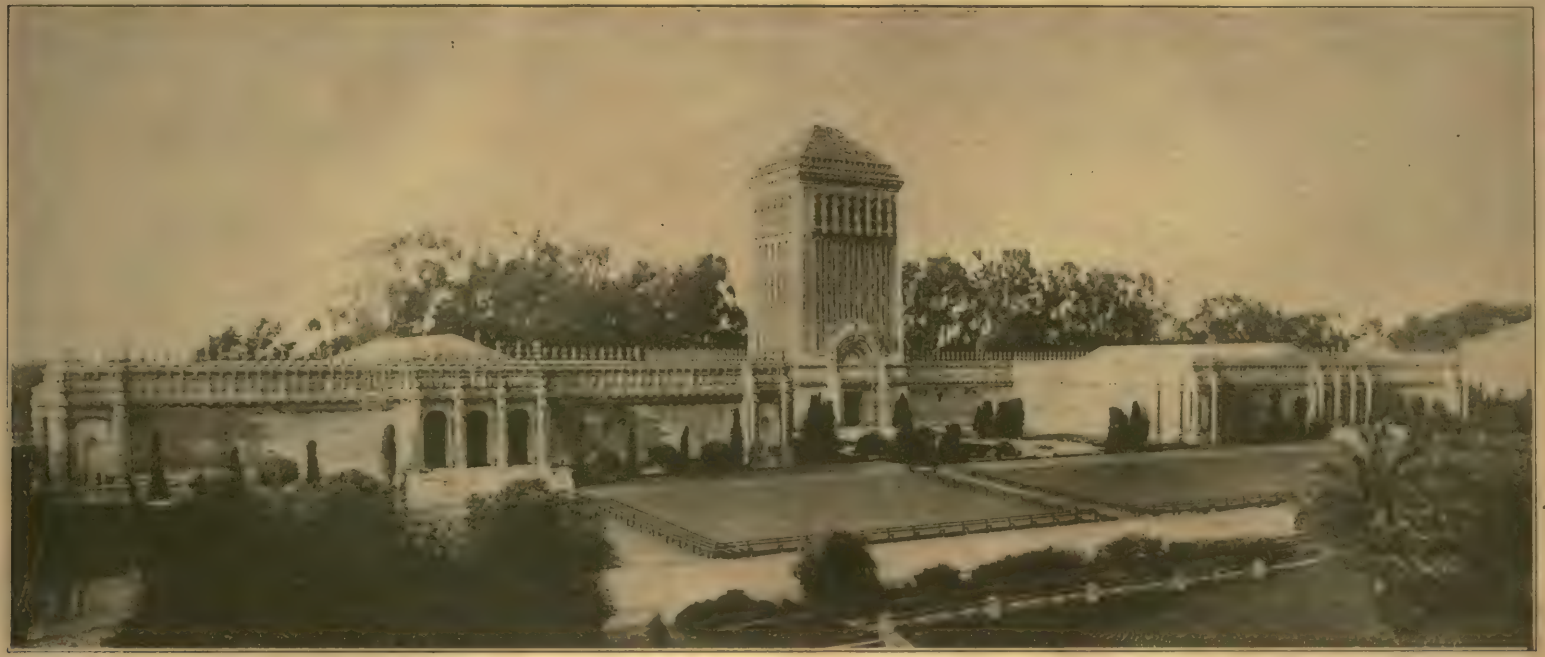

GENERAL VIEW OF THE M. H. DE YOUNG MEMORIAL MUSEUM IN GOLDEN GATE PARK, SAN FRANCISCO.

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